SCIENTIFIC AMERICAN

A WEEKLY JOURNAL OF PRACTICAL INFORMATION, ART, SCIENCE, MECHANICS, CHEMISTRY, AND MANUFACTURES

Vol. XVIII.--No. 17. [NEW SERIES.] NEW YORK, APRIL 25, 1868. $3 per Annum [IN ADVANCE.]

Improvement in Knitting Machines.

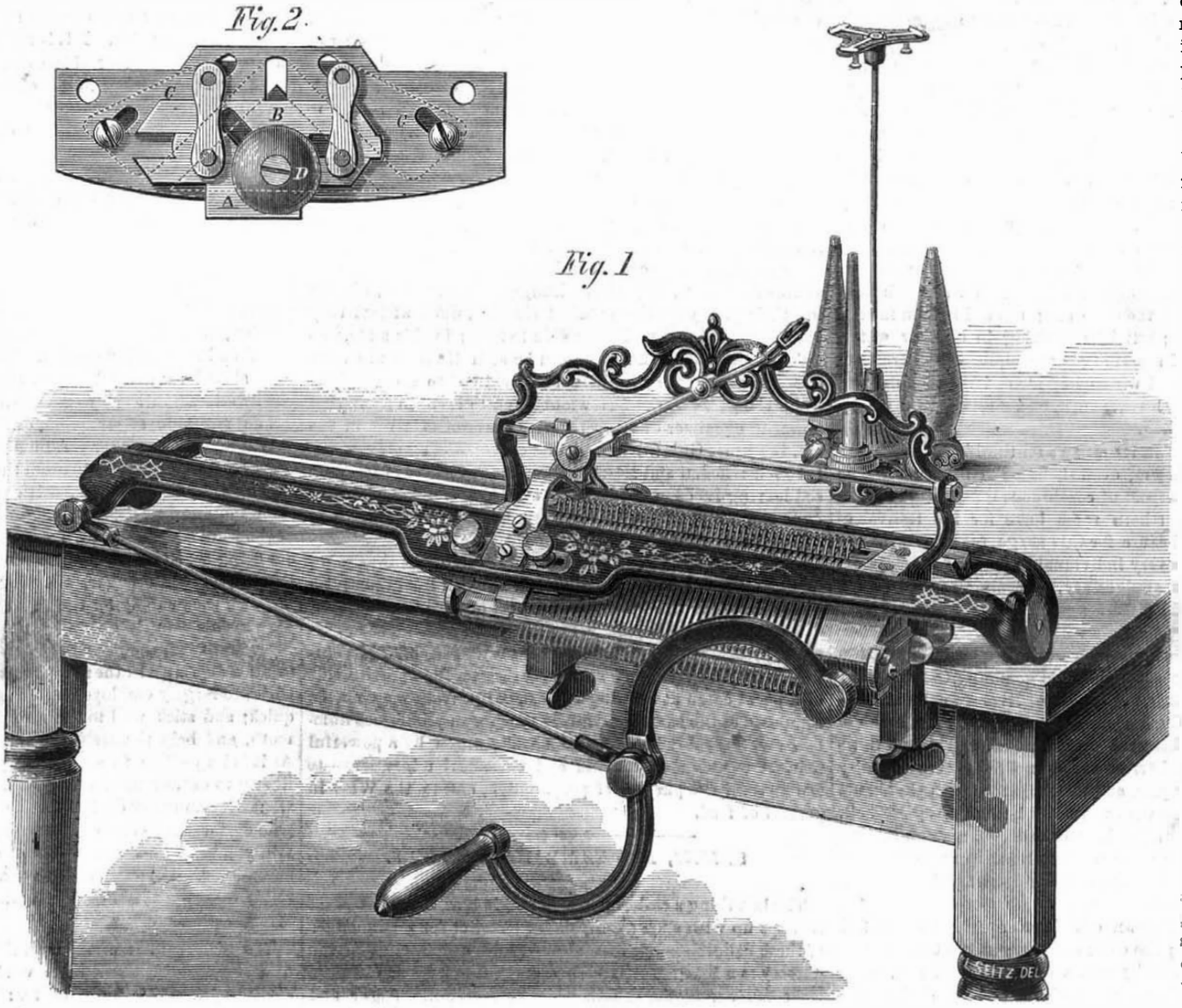
The Lamb Knitting Machine, of which the accompanying engraving is a representation, was patented through the Scientific American Patent Agency in December, 1863. Since then valuable improvements have been added, and at the present time it is claimed to be the best family knitting machine that is manufactured.

The invention relates to that class of knitting machines that employ straight rows of needles, in distinction from the class known as circular knitting machines, but more particularly to the simple and novel method of operating two straight parallel rows of needles in such a manner as to produce a tubular web, to widen and narrow with facility, to form a large or small stocking in the same machine, to knit the heels of stockings, and to produce various styles of ornamental and ribbed work in flat web.

The machine may be described in brief as follows: A needle bed or frame (which can be attached to an ordinary table by means of a thumbscrew), having its two upper sides inclined toward each other, their upper edges being separated far enough to allow the fabric produced to pass down between them. Supported by the needle bed is a carriage, reciprocated by means of a crank. Through the arch that passes over the top of the machine is a horizontal rod upon which moves a slide that carries the guide for delivering the yarn into the hooks of the needles-parallel grooves or channels are cut across the bed in which the needles are placed. In these grooves the needles can be moved their entire length, and can thus be brought into operation for widening, or thrown out of operation for narrowing without removing them from the machine.

Fig. 2.

Fig. 1



THE LAMB PATENT KNITTING MACHINE.

The needles employed are self-knitting, being constructed in such a manner that when fed by the yarn and carried an inch forward and back, they form the loops by their own action. The lower ends of the needles have an upright shank, extending above the face of the needle bed, and are operated upon by cams that are attached underneath the center of the carriage in such a manner as to move the needles forward and back. There are two sets of these cams, one for each row of needles.

Fig. 2 is a representation of one of the sets of cams, which consists of the plate, A, the two wing cams, C C, and the V-shaped cam, B, which is held in place by the screws that pass through the washer, D, in the diagonal slot of the plate, A. As the carriage to which these cams are attached is drawn back and forth over the needle bed by the crank, the needles are carried up on one side of the V-shaped cam in the groove or space between that and the wing cams, at the same time the yarn guide delivers the yarn into the hooks of the needles, which are then drawn down by the wing cam on the other side of the V-cam, thus forming the loops.

The slide, A, is made to shift, by its lower projection coming in contact with adjustable cam stops that are placed at the ends of the needle bed. In Fig. 2, when the plate comes in contact with the right-hand cam stop, the screw through the washer, D, is forced up the diagonal slot, and brings up the V-shaped cam, thus closing the space between it and the wing cams. When closed the needles pass below the cam without operating. By the adjustment of the cam stops either or both of the cams may be left open or closed at the same time, so as to operate the two rows of needles separately, alternately, or together: thus forming four entirely distinct webs—the tubular web, wide flat web, double flat web, and the ribbed flat web.

As any number of needles can be moved up at the start or be moved up or down at either end of the rows of needles at any time, so any size of web can be set up and any number of loops can be added to or taken from it at will. By thus knitting the fabric either tubular, or flat, single, double, or ribbed, in any desired shape, it will produce every variety of staple and fancy-knit goods.

The loops are formed on precisely the same principle as in hand knitting, but, being of uniform length, render the fabric more elastic and durable.

The proprietors say that in addition to the great capacity and completeness of this machine, it especially commends itself to families for its extreme simplicity, enabling any one to operate it from printed directions. The ordinary speed of the machine is about 5,000 loops per minute, producing a yard of plain work in ten minutes, and a pair of socks complete in half an hour. Although it has been but a short time before the public it has attained a reputation and sale during that time which evinces that the want of such an invention is universally felt.

As the patents of the Lamb Machine cover the principle of crossing two rows of needles so as to form loops on both sides of the fabric; and as it can be worked with far greater speed than other machines—can knit with any number of needles, and widen and narrow at will on both circular and flat webs, (either single, double, or ribbed)—and is capable of producing anything, from a watch cord, infant's stocking, or glove, to a shawl or blanket—its value must be admitted.

All are familiar with what the sewing machine has done in furnishing profitable employment to thousands of laboring women. May not the knitting machine be welcome as a labor-saver, and a source of livelihood for the poor?

Certain it is that between five and six million dollars worth of knit goods are annually imported to this country, and that our markets abound with the raw material of which these goods are fabricated.

These machines are manufactured by the Lamb Knitting Machine Manufacturing Co., of Chicopee Falls, Mass., who will cheerfully furnish to any address any other information respecting the machines, with samples of work.

New Facts in Acoustics.

M. Regnault, of the Institute of France, has been making use of the new sewers of Paris for the purpose of testing, on a large scale, some of the questions in acoustics concerning which there has been much doubt. By firing a pistol in tubes and sewers of various diameters, he found that the sound was carried to the following distances: 1,282 yards in a passage of 4·2 inches diameter; 4191 yards in a passage of 11·8 inches diameter; 10,494 yards in a passage of 43 inches diameter. The nature of the materials and the construction of such passages exercises great influence on the rapidity with which sound is transmitted. In the large Paris sewers, trumpets are used to convey orders to the workmen, and it is found that in those passages whose sides are cemented, the sound is conveyed to a much longer distance than in others whose sides are left as first constructed, with the rough stones only. It is one of the primary principles laid down in text books, that the velocity of the vibrations of sonorous bodies in the same medium is the same for all sounds, grave or sharp, strong or feeble, and whatever may be their pitch, but the researches of M. Regnault would seem to show that this generally received belief is not correct. He asserts that sounds of different pitch are not propagated with equal rapidity but separate from each other on the way.

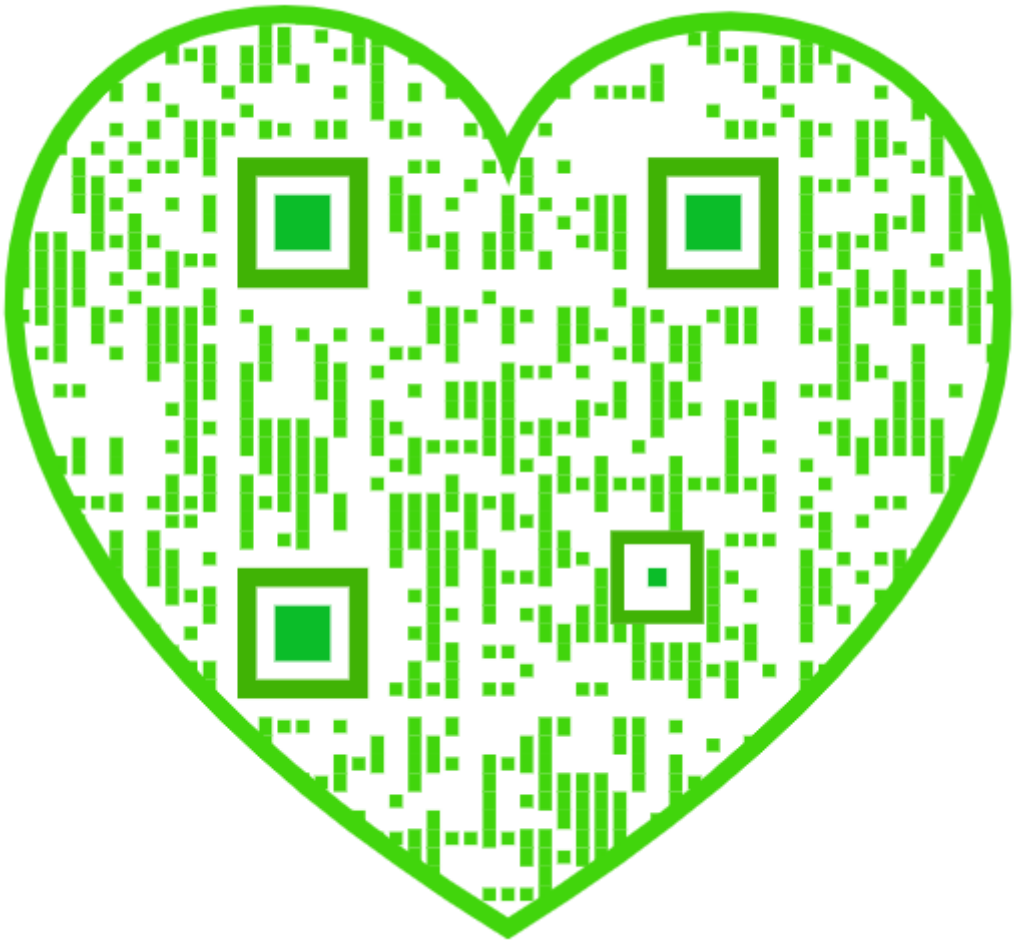
Acute sounds, also, travel with less swiftness than grave ones; thus, when a baritone sang in very long sewers and at the entrance of water conduits, the key-notes were heard at a distance before the harmonics which succeeded it and one another, according to the degree of their altitude. The propagation of sound, consequently, disarranges the harmonics of which it is composed; thus an air embracing a certain extent of the gamut, if heard at a long distance would be seriously altered. This decomposition in tubes may be on account of the friction caused by the sides of the tube or passage way, and cannot be noticed in the open air. The facts propounded by M. Regnault will cause the philosophers to renew their investigations with renewed interest.

LOFODEN NORWEGIAN COD LIVER OIL.

The London *Pharmaceutical Journal* has published a very readable, though somewhat exhaustive article, concerning cod fishing on the Lofoden Islands, the mode of manufacture and other particulars respecting the far-famed Norwegian cod liver oil, much of the information never before having been published. The great length of the article forbids our transferring it entire to our columns, but some extracts will prove of interest.

Every year, early in the month of January, the cod fish begin their great migration from the deep sea. Moving in a northeasterly direction, they approach the coast of Norway and concentrate themselves upon the Lofoden Islands, situated near the northern extremity of Norway, about 150 miles within the Arctic Circle. Immediately on the appearance of the immense shoals of cod at Lofoden, a remarkable result ensues,—all other kinds of fish disappear with one consent. The exact cause of this curious phenomenon is not yet understood, but literally it is the fact that the very herrings used as bait can no longer be taken in those waters, but have to be imported from a distance, and are sold to the fishermen as articles of trade. Two important consequences attend this singular circumstance; one, that the fecundated roe, secure from the predatory attacks of many voracious enemies, has a favorable opportunity for development, whereby a large supply of this valuable fish is maintained; the second, that no other fish than cod can be taken in the nets, and consequent-

© 1868 SCIENTIFIC AMERICAN, INC.



ly, no other livers than those of the cod can be employed in the preparation of the oil.

As soon as the cod are known to have arrived, the fishing begins without delay. The total number of men assembled by the first of February is estimated at 25,000. The quantities of cod are prodigious, their numbers incalculable; a good or bad season does not depend on the variable supply of fish,—that is apparently always the same, and beyond computation,—but upon the weather, as every rough day prevents the open boats putting out to sea, and occasions a serious loss to the whole fishery.

Three different methods are employed in the capture or the cod; the deep line, the long line, and nets. Every afternoon, at a given signal from the surveillance, those fishermen having nets or long lines, row out one or two sea miles to their fishing grounds, set their tackle, then row back and pass the night on shore. Next morning, the signal being again given, they all row as before, take their catch, and return with it during the afternoon. The fishermen with deep lines remain all day at sea, leaving very early and returning in the evening. The distance these have to row is from four to seven English miles.

As soon as the fisherman has come to shore, he proceeds to cut the head off every fish and takes out the roe and liver, thus distributing his catch into four groups. The roe he usually salts immediately. The livers are disposed of in the following manner: some he throws at once into large wooden vessels, holding from eight to twelve hogsheads, and, by frequent agitation and stirring with wooden beaters, obtains from them, at the ordinary temperature, a fine transparent oil, which floats on the surface. This oil is drawn off and preserved separately. The livers thus partially exhausted are then either secured in barrels for the purpose of oil burning at home, or else, being left in the open wooden vessels, suffer decomposition; the oil produced becomes gradually darker, bubbles multiply, gaseous products are freely disengaged, accompanied with an exceedingly unpleasant, penetrating smell, that may be perceived at a great distance. The best livers and the finest oil are taken from those fish that have just arrived from the deep sea; the cod is then fattest, and in best condition; but by remaining in shallow water, where the function of spawning is accomplished, where feeding is not its object, and where little food is to be obtained, it becomes leaner and leaner, until, on its return to the deep sea, it is quite emaciated.

Cod fishing at Lofoden terminates on the 14th of April, according to ancient custom, even though the fishing may be productive, with a prospect of continuous good results. The reverence that the northern races have for the festival of Easter is the original cause for this usage, together with the ardent desire felt by every individual to pass the holidays following that religious anniversary, preceding as they do the joyful spring time and much longed for summer, in his own home.

On arriving at their several huts and villages, the preparation of the oil is proceeded with, and generally completed by the end of May. While the barrels of liver remain at Lofoden, and still more during the journey afterwards, much of the cellular tissues becomes disintegrated, and the oil flows out; so soon as the barrels are opened, the oil is carefully poured off and kept apart, and this, together with that made at Lofoden in the open wooden vessels, is the light yellow oil. The livers having been partially exhausted are then thrown into iron kettles hung over an open fire, the water contained by the livers being allowed to evaporate; the oil is poured off as fast as it becomes disengaged by the warmth, and is put into barrels. This is brown oil. Increased heat above 212 Fahr. is now applied; the color deepens; as the temperature increases, the oil gradually grows darker, till at last, when what remains of the livers floats about as hard dark lumps in oil that is almost black, the process is considered to be finished, and the remaining product is the dark tanner's oil.

In Sweden, Denmark, and even in Norway itself, as well as in other places, there is a prejudice in favor of the brown oil. It is regarded by many as superior in its remedial properties to the light yellow oil. But as the light yellow is an exudation at a low temperature from the liver at its freshest period, and has certainly less flavor and odor than any other kind, it does not appear that this preference is well founded.

Fully sensible of the great natural advantages possessed by the Lofoden Islands, Mr. Möller, of Christiania, has been for many years desirous of introducing into general use a superior method of preparing the oil. Manufactories following his suggestions are in operation at Lofoden, Söndmöre, Christiansund and Finmark. The process he recommends may be thus described: The livers are to be treated immediately on their arrival on shore, being less than one day old. The selected ones, all of large size, are washed for the purpose of removing blood, membrane, and all other impurities. They are then introduced into a machine which reduces them into a paste. The paste is then transferred to an apparatus heated externally by steam, and the mass cautiously warmed to 100° or 120° Fahr.; at the same time it is diligently stirred and pressed with large wooden spoons, so that the oil may be liberated at the lowest possible temperature consistent with economical results. As fast as the oil separates, it is withdrawn; and the stearine being first thrown down by exposure to a temperature under 40° Fahr., is filtered; after which it is considered perfect, and may be put forthwith into barrels and bottles. The fresher the liver, and the lower the temperature the clearer, lighter, and sweeter in taste will be the oil. Livers more than one day old require a higher degree of heat.

Three barrels of liver will yield one barrel of the finer oils, and a quarter of a barrel of dark oil; but these proportions are only approximative, for the results will always vary according to the temperature employed in the process. It is never originally brown, but is liable by lying long in wooden casks to acquire a little more color.

The annual produce of cod liver oil by the Lofoden fisheries is estimated at 25,000 barrels, each containing from 24 to 28 English gallons, and that of all the other fisheries on the coast of Norway at about 35,000 barrels more, making a total of 60,000 barrels. During the last two years prices have not been sufficiently remunerative to encourage the preparation of the fine oil on a large scale; only two manufacturers at Lofoden have done so, and one of these, according to the chief of the surveillance, made only ten barrels this year.

The information now incidentally given relating to the propagation of the cod, the deposit of its ova, and the security of the young fry is, though limited, an important addition to our knowledge of the natural habits of the fish; should further observations confirm the opinion held by practical men on the spot, then it will appear that Lofoden is the natural nursery for these immense shoals of cod that swarm the northern seas. Of course, cod ova may be deposited and hatched on many coasts, our own included, but nowhere on the same scale and with the same great results as at Lofodon.

Immense shoals of cod arriving from the deep sea make their annual appearance on the Norwegian coast early in January and continue there to the end of April. when the last of them return. At Newfoundland, shoals of cod arrive at the end of June and retire in October. By a comparison of these dates, it is apparent that their arrival first on one coast, then on the other, and their departure first from one coast, then from the other, are separated by exact intervals of six months. In both cases they come from and return to the deep sea, that is, the Atlantic Ocean. At Lofoden they arrive, and now alleged, for the purpose of spawning; at Newfoundland, certainly as fish of prey. At Lofoden, all other kinds of fish fly before them, and are suffered to escape; at Newfoundland, they follow in fierce pursuit shoals of capelin, cuttle fish, and herrings. At Lofoden, they arrive in their finest and best condition, leaving thin and emaciated; at Newfoundland, they arrive hungry and ravenous, devouring their prey with the greatest voracity, until at last they become gorged and no longer able to feed; in this state, previous to their departure, they can be seen through the clear water to refuse their favorite food held before them as bait. From the great bank of Newfoundland to Lofoden flows that powerful equalizer of temperatures, that warm river in the sea, the great Gulf Stream. In its course, and about midway between Lofoden and Newloundland, is the island of Iceland; cod leaving Lofoden in March to arrive at Newfoundland in June and July, might be expected between these dates to appear on the fishing grounds of this island; they actually do so, the chief cod fishery in Iceland occurring in the spring and summer. Finally, cod approach Lofoden from the southwest; Newfoundland is due southwest of Lofoden.

Weighing these facts, a very interesting and important inquiry presents itself, whether these multitudes of fish, retiring as they do from one and appearing on the opposite side of a great ocean at definite and exact intervals, may not be composed of the same individuals moving in prodigious numbers and probably in detached shoals, urged by a powerful instinct to pursue systematic and periodical migrations—to the East for the purpose of propagation, and to the West in pursuit of food.

SWEETS, AND THEIR MANUFACTURE.

The last thing a child inquires about is how the sugar plum it snaps up with such avidity, is made. Yet the manufacture of these delicacies—we had almost said necessaries—of the nursery is a thing worth witnessing. A marvellous change has come across the public opinion respecting sugar and sweets of all kinds. They used to be denounced by tender mothers as "trash and messes," and possibly because they were so denounced, they tasted all the sweeter to the little ones. Now there is no attempt to taboo that which delighteth the juvenile palate most. In moderation, there is nothiug more wholesome than sugar; and it is, withal, nourishing and warming, in consequence of the large amount of carbon contained in it. Formerly lollypops were not a speciality; there were no large establishments for their production; they were, in fact, one of the miscellaneous items kept in bottles at the pastry cooks. All the higher-class sweets came from France and Italy, where for ages they have been famous for these delicacies. But the introduction of steam into their fabrication has given to England the lead in manufactured sugar articles, which are now made on the largest scale, and are vastly cheapened since the days when we used to spend our halfpence in toffy. The rude style of old is also gone. The eye must now be satisfied as well as the palate, even in the cheapest items. Think of a halfpennyworth of sweets done up in a ruby-colored gelatine packet. There was color, it is true, in some of the more showy sweets of old, but it was metallic color containing the most virulent poison. Doctor Hassall's analysis of this painted confectionery, published in the *Lancet* some years ago, exposed the villanous manner in which this vividly-colored sweetmeat was made attractive to the children by poisonous paint. The brighter the hue the more deadly the sweet. The brilliant green, for instance, with which the toy confectionery was adorned, contained arsenite of copper, as we shall presently show. One can quite understand the bad name sweets acquired when thus made up. There was vermilion in the reds, of course, and gamboge and chromate of lead in the yellows. No doubt many young children were absolutbly killed by plentifully partaking of these artistically poisoned comfits. The analysis of the *Lancet* has delivered us from this cause of infantile trouble. Nothing but harmless vegetable colors are now used, which if not so brilliant as metallic ones, are quite safe. The production of sugar plums on a manufacturing scale has caused swifter methods of fabrication. The small items, such as rings, scissors, shoes and hats, are cast in starch molds, and the delicate sweets containing some essences, such as pine apple essence and pear essence, are made in the same manner. It puzzles older heads than those of the children to know how this drop of delicious liquid gets into the center of the sweet. Like many other puzzling matters, it is very easily explained. The flavoring essence is mixed with the liquid sugar, and when poured into the mold the latter crystallizes immediately over the former. These essences, so nice to the taste, are the most remarkable examples of the power of chemistry to transform very repugnant materials into delicacies. Fusel oil is the base of the pear essence, and pine apple essence is obtained by diluting ether with alcohol. The chemist in his laboratory with great cunning manufactures scores of these essences, which are supposed to be the veritable product of delicate fruits. Some of the pretty forms that are made to take the fancy of the little ones are simply punched out of flat films of sugar rolled: some are cast, as we have before mentioned; some are pressed into shape, when soft, between engraved rollers. The drops and sweets that are quite clear are boiled so long that all the water has evaporated out of them. Such sweets must be immediately bottled up, or preserved from the air, otherwise they absorb water and become semi-liquid. Barley sugar is an example in point. If it is not hermetically sealed down in tins, it deliquesces, and loses all its crispness. It is as well to know that this is the purest of all sweets—being absolutely clarified sugar, and therefore the most wholesome for children. On the other hand, peppermint drops are the most open to sophistication. They should be made of crushed white sugar, mixed into a paste with gum. But the temptation to adulterate is too great for the dishonest trader to resist; consequently, in order to supply the cheap market, one half plaster of Paris is mixed with inferior sugar. One can quite understand the sickness that overtakes children sometimes after sucking these comfits; the wonder is that such a mass of plaster does not interfere more signally with their digestion. Jujubes, those flexible lozenges which stick so in the teeth, contain a large portion of gum. They are poured into tins to cool, stoved for several hours, sliced into sheets, and then cut by scissors into the well-known diamond shapes.

The veritable sugar plum, or almond drop, is made in a very interesting manner. A number of almonds, after being coated with a little gum to catch the white sugar, are thrown into a deep pan surrounded with steam. This pan revolves sideways at an angle of forty-five degrees. As it revolves the almonds. of course, tumble over one another, and while they are doing so, the workman pours over them from time to time liquid white sugar, allowing sufficient time to elapse betweeu each supply for the sugar to harden upon the comfit. In this way it grows by the imposition of layer upon layer, until it is the proper size. By this simple motion, the sugar is deposited in the smoothest and most regular manner. Girls are largely employed in the sugar plum trade; they are quick, and stick well to their work; but they have a sweet tooth, and help themselves to the lozenges pretty liberally. As it is impossible to stop petty pilfering, they are given liberty to eat as much as they like, and the establishment we went over annually debited itself with a sum of two hundred pounds for the sweets consumed by the children. They certainly did not look any the worse for their unlimited consumption of lollypops, and gave a sufficient answer in their ruddy faces to the old charge against the deleterious nature of sugar plums.

The manufacture of the surprise nuts is done with the utmost speed by these little workwomen. The nut is first opened by means of a rose cutter; the kernel is then cleared out with a penknife, the hollow is filled with seedsweets, and the hole by which they have been introduced is sealed with chocolate. It is great fun, of course, when you have cracked a nut to find your mouth full of these small sugar seeds, whether you expected the surprise or not. In one part of the establishment we came upon the little artists coloring the small articles cast in sugar. It was all vegetable color, of course, and quite harmless. There is no great artistic talent required in the coloring operations they have to perform, and it is too cheaply paid to be very carefully done; but however poor they may be as works of art they are not unwholesome, which, as we have before said, was far from being the case a few years ago, before Doctor Hassall turned detective officer for the good of our little ones. Here, for instance, is the report of some mixed sugar ornaments, just such as we have described the children coloring:

"Purchased in Middle Row, Holborn. The confectionery in this parcel is made up into a variety of forms and devices, as hats, jugs, baskets, and dishes of fruits and vegetables. One of the hats is colored yellow with chromate of lead, and has a green hat band round it colored with arsenite of copper; a second hat is white, with a blue hatband, this pigment being Prussian blue. The baskets are colored yellow with chromate of lead. Into the coloring of the pears and peaches the usual non-metallic pigment enters, together with chromate of lead and middle Brunswick green. This is one of the worst of all the samples of colored sugar confectionery submitted to analysis, as it contains no less than four deadly poisons." That the fashionable West was guilty of selling sweets equally adulterated with those of the Drury Lane and Holborn shopkeepers, we give in proof one more analysis of a fish purchased in Shepherd's Market, May Fair: "The top of the nose and the gills of the fish are colored with the usual pink, while the back and sides are highly painted with that virulent poison, arsenite of copper." We might describe scores of specimens purchased in every quarter of the town

© 1868 SCIENTIFIC AMERICAN, INC.

full of the like poisonous matter, but they are now things of the past. It is a misdemeanor to use metallic color in confectionery; it is just possible, however, that some of the old sweets may still remain unsold, so we bid parents beware of any sugar plums with vivid greens and reds, for they are sure to be poisonous.

Steam has helped us to undersell the French; now we export to that country much of the coarser kinds of sweets. In England we make for children, in France the "bonbon" is made for children of a larger growth. Nothing can exceed the taste with which the sweets are put before the public across the Channel. The boxes they are packed in are works of art in themselves. About Christmas time some of our leading West End shops are full of the artistic confectionery from the Parisian manufactories. It looks so pretty that we scarcely like to demolish it. It must be remembered that the presentation of caskets of sweets is a custom among the fashionables in France; our neighbors have, therefore, to meet the critical and fastidious taste of adults, and hence comfits, etc., rise in that country to works of art. We like sweets in this country, but we are too great cowards to own it; we do not doubt, however, that simpler tastes will prevail, and cause more artistic skill to be exhibited than is now thought necessary for our nurseries. If we expect a large export trade it should not be forgotten that other nations require even their sweets to be presented to them in a graceful form. In order to show the increase that has taken place in the trade, we may state that twelve years ago our entire make did not exceed eight thousand tuns, whereas in 1862 it had risen to twenty-five thousand tuns, and is now not very far short of thirty-five thousand tuns per annum. This amount does not include the rough sweets made in the hucksters' shops, nor the toffy made at home, which is not inconsiderable. If the whole nation should go back to the tastes of our childhood, like the French, the production would at once mount up to double the score at which it figures at present. That the English have a sweet tooth, witness our rich port wine, which is in itself a confection, such as no other nation but ourselves under the sun will drink. Such being the natural tendency of our palate, we do not doubt but that we shall take to sweets as naturally as the Italians do, albeit we have no carnival in which to use them as pleasant missiles.—*Every Saturday.*

ACROSS MT. CENIS—FELL'S MOUNTAIN RAILWAY.

"S. H. W." sends us the following supplementary account of his trip over Mt. Cenis:

"We left Turin on the 5 o'clock evening train for Susa, situated at the foot of the mountain, the trip occupying two hours. Upon reaching the station, we learned that the dilligences were not to leave until 2 o'clock in the morning; therefore, betaking ourselves to a small, dismal-looking inn, we obtained a comfortable dinner—anything eatable tasting good to a hungry man. We then bunked down for a quiet nap, but were aroused at 1 o'clock to prepare for a start.

"We found, at the station, a crowd of passengers, who had come up from Turin on the 11 o'clock train; and it was very evident that those who had not secured their places in advance, would have to take up 'with pot-luck.' Being fortunate, however, in this respect, we had only to amuse ourselves by waiting and watching the movement of things. Four immense dilligences were got ready, and, by the aid of a pair of stout horses on the wheel, and five pairs of mules attached to each vehicle, we began to ascend the mountain. The moon was shining full and clear, enabling us to obtain a good view of the scenery; and, after journeying for three hours, during which time we had made but nine miles, the passengers with their baggage were all unloaded, in order to take the dilligence sleighs, as we had reached the regions of snow.

"There were eight of these clumsy-looking vehicles, and to provide for their movement the teams were divided into sixes—one horse in the shafts, led by five mules following each other in line, and presenting a novel sight, as this long procession wound its way up the zig-zags of the mountain. We continued our slow journeyings in this manner for several hours, until we had gained the summit,—the night, owing to the brilliancy of the moon emerging almost imperceptibly into the cold gray of the morning.

"At this point, upon the summit, the mules were dispensed with, and two pairs of heavy horses were attached to each sleigh. The wind blew a sharp nor'wester, the snow came dancing down the mountains, and drifted itself in our way to such an extent that workmen were engaged in keeping the path open. The scene was bleak and cheerless in the extreme. We had been suddenly transferred from the genial sunshine of Italy, to a winter's day as cold and blustering as ever swept over the green hills of Vermont. Even the little mountain cataracts were glazed over by ribs of ice, with pendant icicles. Upon reaching the point where the road begins to descend, one horse only was needed on each sleigh; and right rapidly did he dash down the mountain, the old sleigh swinging around the sharp curves, as if hung upon a pivot. It was our first sleigh ride of the season; and though hungry and cold, we enjoyed it as rare sport, though I judge from home letters that it would have been no great rarity to you. By means of a break, to grip into the snow, which the driver managed with considerable engineering skill, the steep descents and sharp curves were made with comparative ease and safety.

"At the end of the snow region we were all again unloaded and repacked into dilligences, this time drawn by five horses, the leaders working three abreast. There were an army of conductors, drivers, and riders; but no noise, no unnecessary whipping, and no confusion, in making the many changes of vehicles and animals.

"In this way we journeyed to San Michel, the railway terminus on the French side, which point we reached at noon, having in the mean time once again changed horses. At San Michel we were met by the French custom-house officers, who extended to us a cordial reception. The passengers, by this time, were tolerably hungry, and did full justice to the provisions of the restaurant; 'so that the cats and dogs had reason to lament the polish of the bones.'

"An hour's time was just enough to go through the formalities of the occasion, and at one o'clock in the afternoon, we were off again, but this time in a comfortable railway carriage, expecting to stop for the night at a place called Culoz, at the junction of the roads to Lyons, Paris, and Geneva. Upon getting out of the train, however, we found out just in time that there was no hotel short of a carriage ride of three miles to the village, therefore we took the next train for Lyons, where we arrived at half-past ten in the evening. The trip from Turin to Lyons, altogether, combined more of novelty than anything we had before experienced.

"Fell's over-mountain railway, which has already been described in the SCIENTIFIC AMERICAN, follows the windings of the dilligence road all the way from Susa to San Michel, and is a bold curious piece of engineering. The work upon it was suspended during the winter months, but the superintendent expected to have the cars running some time in May.

"Over the higher portions of the mountains, and for several miles along where the snows are most troublesome, the road is being covered in by heavy masonry supporting a corrugated iron roof. Somebody has had faith enough in the success of this enterprise, to spend a vast deal of money upon it; and with a good deal of care bestowed upon the track and machinery, I do not see any reason why it may not be a safe, and, certainly, a much more rapid and comfortable mode of crossing Mt. Cenis than by dilligence.

"Lyons, next to Paris, is the largest city in France. It is, moreover, an exceedingly fine place, built in an excellent situation. The inhabitants live by the manufacture of dress silks, ribbons, and velvets. There are no large factories, but the work is chiefly carried on at the homes of the weavers. Jacquard looms are to be seen through almost every window, as one passes through the quarter occupied by the weavers, and a fine monument to the great inventor has been erected in one of the public places. At the present time weaving is very dull, and the operators are suffering considerably.

"The distance from Lyons to Paris is 319 miles; the express train runs through in ten hours, including fourteen stoppages. The railway is a model of good management."

Correspondence.

The Editors are not responsible for the opinions expressed by their correspondents.

Correspondence of the Sun with the Clocks.

MESSRS. EDITORS:—One of your correspondents asks, page 197 of this volume, "Why is the sun's center on the meridian ever back of the clock?" and you answer: "Because of the elliptical orbit of the earth, and the inclination of the earth's axis on the ecliptic." Allow me to remark that the sun's center is *not* always back of the clock, but half the time ahead of it, and that the inclination of the earth's axis has nothing to do with this phenomenon, which constitutes the difference between the mean time and solar time. The explanation is this:

On a well regulated clock, the days of twenty-four hours have of course exactly the same length; but the solar days, when measured by the time that the sun daily reaches the meridian, have not the same length; this is not caused by any irregularity in the daily rotation of the earth around its axis, as this rotation is perfectly regular, and proved by the most acute astronomical observations not to vary the least fraction of a second during several centuries (at least, at the present stage of the earth's existence); but it is caused by the fact that the earth, during its yearly revolution, does not remain at the same distance from the sun, its orbit being an ellipse, as you remarked in the answer above: the earth thus moving sideward in relation to the sun, and at the same time alternately approaching or receding, accelerating and retarding in its yearly orbit, causes an irregularity in the apparent place of the sun at the time of its crossing the meridian, or, in other words, the apparent daily motion of the sun is sometimes accelerated and sometimes retarded, and therefore the center of the sun passes the meridian sometimes before noon and sometimes after, when this time of noon is taken by a well regulated clock.

Tables have been calculated, founded on observation, how much these differences are for each day of different years, to within a fraction of a second, and such tables, with many others, are published several years in advance, by the Government at Washington, for the use of navigators, under the title of *American Ephemeris*. I extract from the *Ephemeris* for 1869 the following facts:

On Jan. 1, 1869, the sun will be behind the well regulated clocks nearly 4 minutes; March 1, nearly 12½ minutes; April 15, the sun will be nearly equal with the clock; May 15, the sun will be ahead nearly 4 minutes; June 15, the sun will be nearly equal with the clock; July 26, the sun will be behind nearly 6½ minutes; Sept. 1, the sun will be nearly equal with the clock; Nov. 2, the sun will be ahead nearly 16½ minutes; Dec. 24, the sun will be nearly equal with the clock.

It will be seen that the sun is four times a year equ with those well regulated clocks, which indicate the mean or average time, namely, April 15, June 15, Sept. 1, and Dec. 24; the sun is twice a year ahead of the clocks, namely, from middle of April to middle of June, and during the months of September, October, November and December; for the rest of the year the sun will be back of the clocks, and this change is taking place very gradually from day to day; the maximum days are given above.

Those dates and times shift slightly for other years, but to so small an extent as to be of importance only for navigators and astronomers, the same as the seconds and fractions of seconds given in the government tables, which I neglected in the above extract, for obvious reasons.

P. H. VANDER WEYDE, M. D.

Steam Temperature and Expansion.

MESSRS. EDITORS:—The expansion of saturated steam depends upon the temperature, and its pressure is about in propertion to its density. The expansion of a given pressure is easily found by formulæ patent to those who pretend to any theoretical knowledge upon the subject. Saturated steam does not exactly expand in accordance with the Mariotte-Gay-Lusac law, nor does any vapor, or even atmosphere, follow correctly the aforesaid law; in fact, the engineering world has to make the calculation by formulæ based upon practical results, obtained experimentally. The expansion of steam cannot be found correctly for any given pressure or temperature by the use of one formula. The existence of over forty-five different formulæ prove that we know as much about the expansion of steam as we know of the square of a circle; furthermore, steam (superheated steam) can exist at all temperatures, even below zero; if such was not the fact there would be no water in liquid form on the globe; it would have been long before this time, changed into solid ice at the polar regions.

It requires but a few words in order to show the error of Mr. Sisson's ideas regarding his own theory on expansion of steam. (See page 52, current volume.)

It is a well known fact to almost every apprentice in a machine shop, that steam engines cutting off steam, at usual pressure, at one fourth stroke, or below, still exhaust steam at a temperature above 212° of heat; if Mr. S.'s assertion be true, it would prove all steam engines cutting off steam at one half stroke, or below, a nuisance, they could not exhaust anything but water at a temperature far below the boiling point. Did this fact ever occur to Mr. S.?

Mr. S. also affirms that steam at seventy-five pound pressure cannot expand to twice its bulk without going below 212° of heat. I would advise Mr. S., in order to convince himself of the utter fallacy of his ideas upon steam expansion, to place his hand into the exhaust pipe of an engine that is working steam at seventy-five pounds pressure, at one fourth stroke, and I affirm that he will find nothing left of his theory but a burned hand.

Mr. S. speaks of expanding temperature to double its bulk, etc. Does Mr. S. measure heat by the bushel, or by weight?

Buffalo, N. Y. H. W. D.

House Fly Parasite.

MESSRS. EDITORS:—One afternoon, during the summer of 1866, a common house fly attracted my attention, from being thickly bespread with what seemed to be a red powder. After capture I detached some of the colored matter and placed it under the microscope, when it was immediately resolved into well developed insect life, apparently of the "tick" family, and of a cochineal color; repeated observation and experiment gave like result, then, and in the summer of 1867.

Having never seen an account of similar experience, nor met with any who have, perhaps your extended observation and acquaintance might throw some light on the matter, as to whether the occurrence is general, or confined to locality; or whether the fact has any bearing on the transmission of diseases among humanity. The latter idea may appear far-fetched, but it will be recollected that flies were at one time a plague to the Egyptians; probably from quantity, but possibly from some other cause. Judging roughly, it would seem a fair estimate to say, that did human parasites bear the same proportion to man, as those spoken of to the fly, we should have fleas and other "outside passengers" of about one fourth pound each in weight. ENTERPRISE.

Cincinnati, O.

Potassium and Sodium in Manures.

MESSRS. EDITORS:—On page 217, present volume of your paper, I notice an article stating that M. Eugene Peligot disapproved of the use of potassium and sodium as fertilizers, because by experiment he could find no traces of their presence in vegetables grown on soil where they had been used. Now, I used a quantity of compound sodium, that is, in the form of carbonate of natron, on my farm, and thereby made five spears of grass to grow where one grew before, and twice as stout. Yet, by analyzing the vegetable, I would not, perhaps, find a particle of sodium, while it was the very element of its growth. I pretend to say that potassium, or sodium, especially when combined with carbonic acid, is of the greatest benefit to vegetables. They undergo chemical combinations with the soil, thereby setting other substances free which nourish the plants. E. C. HASERICK.

Lake Village, N. H.

Self-adjusting Telegraph Magnets.

MESSRS. EDITORS:—Your correspondent, "S." (page 178), in asserting that a self-adjusting magnet is an impossibility, evidently refers only to the case of lines worked with two terminal main batteries and a "closed circuit," as is the usual custom in this country. If the transmitting station *only* uses a battery, it is evident that the key will break the *whole* of the electric current in all cases. This is known as the "open circuit" arrangement, and was formerly employed on the Bain lines in this country, and is at the present time much used in Europe.

The vital principle of Duxbury and Roberts' system referred

© 1868 SCIENTIFIC AMERICAN, INC.

to by your correspondent, D. C. S. (page 211) is that of working with reversed currents, the dots and dashes being transmitted with one poole of the battery and the spaces with the other by means of a reversing key. This method necessarily renders the receiving magnet self-regulating, because the same force is alternately used to move the lever in one direction and the other, opening or closing the local circuit as the case may be. This principle of working reversed currents is as old as the English needle instrument of Cooke and Wheatstone. The Morse system has also been worked with reversed currents for a number of years in Europe, with the best results, the relay being composed of a straight, soft iron bar movable within its helix, and which plays between the opposite poles of two fixed permanet magnets. This is obviously better than Duxbury and Roberts' plan of using neutralizing local batteries, whose electro-motive force is necessarily variable.

In his communication, "S." remarks that "a self-adjusting magnet must be one that will obey changes of current, no matter how slight, when made by the operator, but will refuse to act from accidental causes, however great," and as no magnet can do this, therefore, a self-adjuster "is an impossibility." If the accidental disturbing cause, produces a greater effect on the receiving instrument than the transmitting key at the remote station, it would clearly be equally impossible for an *operator* to adjust his instrument so as to receive the communication. What is needed in an instrument of this kind, is merely that it shall do its work *as well* as a practiced operator, and I see no reason to doubt the possibility of the invention of such an instrument adapated to the requirements of the Morse lines as now worked in this country.

Electron.

New York city.

Rattlesnake Poison---its Antidote.

Messrs. Editors:—On page 198, current volue, of your journal I notice a statement that Dr. S. W. Mitchell, of this city, has been experimenting upon the venom of rattlesnakes, and thinks there is no antidote to the poison, the remedies usually applied being nearly or quite useless.

I was somewhat disappointed at this announcement, as I had hoped and believed that we had found a perfect antidote to all poisons of reptiles and insects, in iodine and iodide of potassium. Several years since, Dr. J. S., now of this city, informed me that he had practiced medicine for 18 years near the Blue Ridge, in this State; that during that time he had had a number of cases of rattlesnake bite, and never failed to cure with iodine, or iodide of potassium, externally applied.

Inclosed I send you an article, cut from a paper published some two years since. I am anxious to learn if Dr. Mitchell has tried this remedy and found it of no use:—

"After many experiments by the officers of the Smithsonian Institute, and other scientific gentlemen, a certain cure is said to have been found for snake bite. It is as follows: Ten grains iodide of potassium, and thirty grains iodine, to be dissolved in one ounce of water, to be kept in a bottle with a ground glass stopper, and to be applied externally—*never internally*. If possible, stop the circulation in the parts bitten by bandaging, and use a stick or anything to tighten the bandage, and apply the solution to the bite with a piece of cotton, sponge, or anything that will hold the fluid, and then bind it to the wound and keep wet until the cure is effected. It is said that five drops of undiluted poison from the fangs of a rattlesnake, mixed with five drops of the above solution, and inserted in a wound with a syringe, was as harmless as ten drops of water." D. S.

Philadelphia, Pa.

Messrs. Editors:—I see an article in No. 13, current vol., on the poison of rattlesnakes, in which Dr. Mitchell, of Philadelphia, asserts there is no antidote to the poison of rattlesnakes. I will state, for the information of the Doctor and others, that there is an antidote for the poison of the prairie rattlesnake, the large yellow rattlesnake, and copperhead snakes. I will give the remedy so that no one can mistake. Take a handful of garden rue; bruise it with a hammer; lay it in a dish, and add half a pint of the best cider vinegar, and then let it stand for five minutes. Then take a rag or sponge and apply or bathe the snake-bite wound with the liquid of the rue; then, after bathing a few minutes, take the rue out of the vinegar and apply it, as a poultice, to the wound, and renew the poultice as long as there is fever, and the cure is effected permanently. Alcoholic liquors are very good, but rue and vinegar will relieve all pain in five minutes after being applied. I have seen it tried on four persons, and also on horses and cattle, and never knew it to fail.

Isaac B. Hymer.

North Manchester, Ind.

Vaccine Virus---Inoculation for Small Pox.

Messrs. Editors:—In a recent article on the cholera, in the Scientific American, the casual remark is made that "the small pox is made harmless by passing the disease through one of our domestic animals."

Although this is the popular belief, it is not true, in fact. Vaccine matter was originally obtained from an irruptive disease peculiar to the cow, and, for aught I know, is still so obtained as occasion or opportunity may offer, and not by inoculating one of those animals with the virus of the small pox, as many suppose.

Many years since the small pox broke out in my native town; a young resident physician, acting on this idea, and desirous of procuring vaccine matter as pure as possible, inoculated a healthy young cow with matter from one of his patients, and with matter thus obtained inoculated a number of children. The result was the small pox, in its worst form.

Perth Amboy, N. J. G. O. Read.

Royal Institution.

The London *Engineer* says: Prof. Tyndall has closed his series of lectures on "The Discoveries of Faraday," the last two afternoons of the series being devoted to the explanation of the phenomena of diamagnetism, and the action of the magnet upon rays of light. The experiments were, therefore, necessarily of a very curious and interesting description, the following being one of the best of them:

In the annexed engraving, Fig. 1, A is the electric light between the two carbon points; B and C are Nicol's prisms to

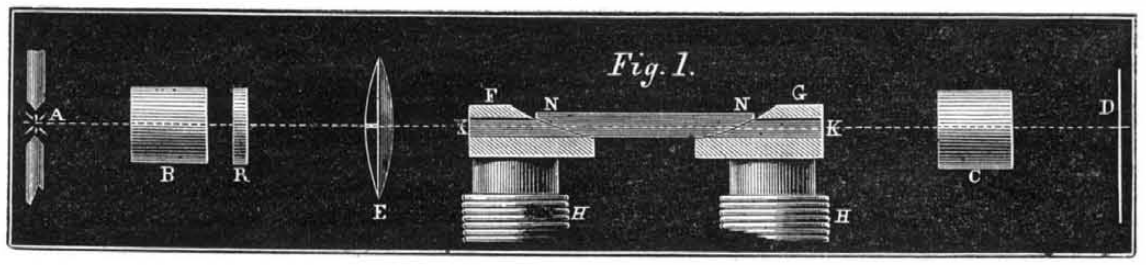


Fig. 1.

polarize and analyze the ray of white light, A D. A double convex lens is placed at E, and F G are two movable poles of peculiar shape placed upon the top of the electro-magnet, H H. The square movable soft iron poles have holes through them, K K, to permit the passage of the ray of light. N N is a short square transparent rod of Faraday's heavy glass. R is a thin transparent circle of quartz, composed of two half circles, one being a piece of right-handed quartz, and the other a piece of left-handed quartz, placed opposite to each other, and so arranged that the two halves should give either complementary or the same colors in the polariscope. The lecture room was darkened, then a beam of light was sent through the whole arrangement described above, and the lens, E, so adjusted that a small circle of light was projected upon the screen, D. The quartz circle, R, was then turned till its two halves gave exactly the same color upon the screen. Upon sending a current of electricity round the electro-magnet, H H, the magnetism produced exerted some peculiar action upon the piece of glass, N N, which caused one half of the circle of light upon the screen to change to a red color, and the other half to a green. When the current was sent round the magnet in the opposite direction the colors upon the screen were reversed, the red and green changing sides with each other. Upon breaking the current the whole disk assumed its normal puce color, both halves of the circle being then alike. When the piece of heavy glass was removed from between the poles of the magnet none of the effects just described could be produced, thereby proving that the magnetism sets up some change in the molecules of the heavy glass.

In place of Faraday's heavy glass a solution of sugar without the aid of magnetism, will cause the plane of polarization to rotate. But this phenomenon is not exactly of the same kind as that discovered by Faraday. For instance, if the ray be sent through the solution of sugar it will cause the plane of polarization to rotate in one direction, and if it be reflected back again, through the solution, it will be rotated in the other direction, and these two actions will neutralize each other. When the ray, on the other hand, is reflected back again through the heavy glass the original effect is increased instead of neutralized. Faraday's method of reflecting the beam several times through the glass was a marvel of experimental ingenuity and simplicity, as shown in Fig. 2, where A is a square block of heavy glass. B B are the portions of the two

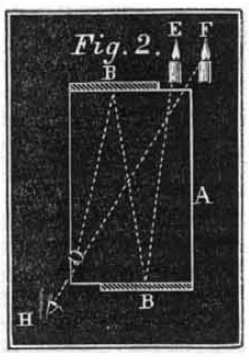


Fig. 2.

ends of the glass which were silvered to produce the desired reflections. Now, let a candle be placed at F, a ray of light from it would traverse the glass in a straight line, and enter the eye at H, without being reflected. But let the candle be shifted to E, and the ray of light would have to be reflected twice, as shown by the dotted lines, ere it could enter the eye. On shifting the candle, E, still further to the left, the ray must undergo a still greater number of reflections ere it could enter the eye.

The lecturer stated that although Faraday was very bold he was very cautious, and he never ventured to express an opinion as to the exact change in the position of the molecules of the heavy glass set up by magnetism. As far as Professor Tyndall knew, Sir William Thomson is the only philosopher who has ventured an opinion upon the subject, and he thinks that in this experiment the magnetism makes the molecules of the heavy glass take up a motion of rotation. To show that in all probability magnetism brings a strain to bear upon the molecules of heavy glass, Professor Tyndall took a prism of this substance and bent it in the polariscope, and the strain enabled light to find its way through the prisms of Iceland spar, although the latter were so arranged that light could not get through till the prism of glass under strain was interposed. Biot's new experiment, wherein a long piece of glass vibrating longitudinally is placed crossways between the prisms of the polariscope, was also exhibited to show that glass under the influence either of a strain of tension or a strain of compression has an action upon polarized light.

After the discovery of the effects of magnetism upon polarized light, Faraday hung a piece of heavy glass by a thread between the poles of his electro-magnet, and found that the bar placed itself at right angles to a line joining the poles. He then tried other substances, and tabulated the results, giving at the same time the name of diamagnetism to the new phenomena. The experiments in diamagnetism were difficult te present to a large audience, because of the smallness of the effects, but Prof. Tyndall overcame the difficulty by placing an electric lamp in front of the electro-magnet, and throwing a large shadow of the latter upon the screen. Hence any motions of little pieces of bismuth or other diamagnetic substances were seen upon the screen by everybody present. Pieces of carrots, apples, and such things were thus shown to be acted upon by magnetism. The lecturer specially pointed out the remarkable fact that although nitrogen is inert to the magnetic force, and oxygen is attracted by it, yet nitric acid is diamagnetic. Lastly, he exhibited the action of the magnet upon flame, by placing a lighted candle between the closely approximated poles of the electro-magnet. When the magnetism was induced by the electric current, the flame instantly bent down as if a stream of wind were blowing between the two poles.

Mr. Harcourt, Secretary to the Chemical Society, gave a Friday evening lecture at the Royal Institution on "The Times in which Chemical Actions take place." His experiments were in some cases so delicate as to be more fitted for the laboratory than the lecture room, but were of a very curious character, trenching upon a quite untrodden branch of molecular physics. He added some chloride of barium to sulphuric acid, the result being that a white milky precipitate was instantly produced. Next he added chloride of calcium to sulphuric acid, and the sulphate of calcium formed so slowly that the liquid took many minutes to turn milky. Some sulphurous acid was next added to a weak solution of bichromate of potash, a green color being immediately produced. But when oxalic acid was added to a solution of bichromate of potash, decomposition took place very slowly.

In the next experiment Mr. Harcourt heated solution of nitrate of ammonia very carefully, the result of heating this salt to a temperature short of 212° F. being to resolve it into nitrogen gas and water. As the salt in the solution diminishes in quantity the volume of gas given off becomes less and less. To make this experiment with scientific accuracy the lecturer nearly filled a flask, A, Fig. 3, with the solution, and a Centigrade thermometer, B, was fixed in the cork,

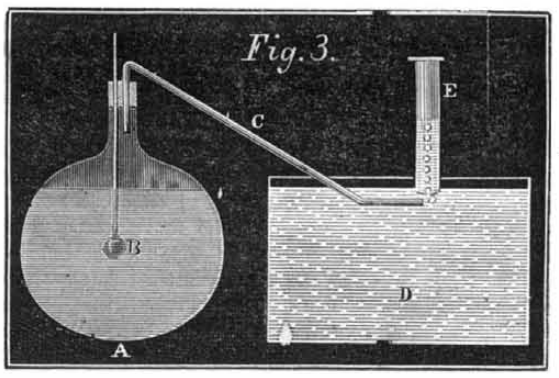


Fig. 3.

so that the bulb should be beneath the surface of the solution. A bent tube, C, conveyed the gas as it was formed into the pneumatic trough, D, where it was collected as fast as formed in long narrow gas jars similar to that at E. The mode of operating was this: A flame was applied beneath the flask, A, and the temperature of nitrate of ammonia gradually raised to 88° Cent.: when this degree of heat was reached the flame was turned down to keep the solution steadily at this temperature. The gas generated before this temperature was reached was allowed to escape. When the liquid kept steadily at 88° Cent., the gas given off was allowed to flow for one minute into gas jar No. 1, next for one minute into jar No. 2, and so on till five jars had been used, each containing the quantity of gas given off in one minute by the solution at a fixed temperature. The result proved that there was a relation between the quantity of nitrite in the solution and the quantity of gas given off. The jars, when arranged on the lecture table, gave the rough outline of the curve, A B D, Fig. 4.

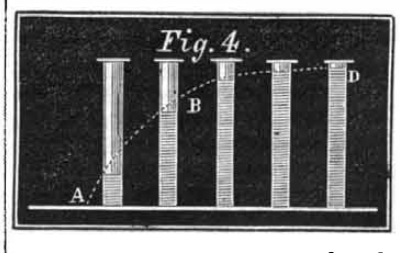


Fig. 4.

In the next experiment four flasks were half filled with a solution of oxalic acid, a little sulphuric acid being also added. simply to quicken the action in the presence of the audience. A little measured permanganate of potash was then added to the first flask; half a minute then elapsed, and a little permanganate was added to the second flask, and so on throughout the series, half a minute being allowed between the measured additions to each flask. A yelow precipitate gradually formed in each flask after the addition of the permanganate. Next a solution of iodide of potassium was added to each flask, and this stopped the action going on by destroying all the undecomposed permanganate in the solution, iodide being liberated in its place. As it is possible to measure the exact quantity of iodine thus liberated, the quantity of per-

© 1868 SCIENTIFIC AMERICAN, INC.

manganate undecomposed when it was added can be ascertained, and the amount of decomposition in a given time tabulated. The lecturer then read some tables formed from similar experiments, which among other things showed that heat considerably accelerates chemical decomposition.

Lastly, Mr. Harcourt attempted a more complicated experiment still, too delicate for the lecture room; it did not go off well, nor were the conditions clearly explained. The lecture, as a whole, however, was of high philosophical interest, the experiments belonging, as they do, to a new and untrodden field. Some curious experiments of a different kind, on the time in which chemical actions take place, were described in *The Engineer* two or three months ago, under the title of "Molecular Physics."

Other curious facts relating to the time consumed by chemical actions are shown in the combustion of Capt. Schultze's new gunpowder, now under trial by the Prussian government. This powder burns very slowly in the open air upon a plate, and leaves a bulky black deposit, yet when inclosed in a gun it explodes with great velocity, and leaves no deposit.

On Friday, March 13th, Mr. Jevons gave an evening lecture at the Royal Institution, on the "Exhaustion of our Coal Mines," Sir Henry Holland, Bart., F.R.S., presiding.

Mr. Jervons said that his remarks would be principally based upon the fact that the amount of coal extracted from the mines of Great Britain in the year 1866 was 101,000,000 tuns, while that of the whole world was as nearly as can be ascertained 176,000,000 tuns, our country thus producing 73 per cent of the whole. In regard to bulk and weight it is by far the greatest trade we have, as shown by the following figures:—

Total Weight of Goods (except Live Stock) Carried in 1865 upon the Railways of the United Kingdom.

	Tuns.
General Merchandise	36,800,000
Minerals (approximately)	18,300,006
Coal and Coke (approximately)	59,500,000
Grand total in 1865	114,600,000

A few of the railways, in their returns, did not distinguish coals and minerals, hence he has been obliged to separate them into the proportions carried by other railways, and the result was not far from the truth. Half the carrying power of British railways is occupied in conveying this coal, which is the "philosopher's stone" of the country, not because it turns everything into gold, bnt because it makes everything cheap, does so much work, and is the maintaining of the material power of the nation. These results are due to the fact that it is capable of producing heat in such great quantities, and heat and mechanical power are convertible terms. It is rather a humiliating fact that all the mechanical power exerted by a man during his life is more than covered by the power stored up in one poor cart load of coal. In fact, the annual coal produce of the United Kingdom is equivalent to the power exerted by 530,000,000 horses, working eight hours per day, for one year. The work of raising this coal is something immense. The Great Pyramid is reported to have been raised by 100,000 men, working for twenty years, and it contains 3,394,307 cubic yards of stone. The coal raised by about 250,000 British coal miners in the year 1865 was about 100,000,000 cubic yards, or thirty times the bulk of the Great Pyramid.

If the use of coal did not tend to increase, and the present annual yield of 100,000,000 tuns in these islands did not tend to alter, he should have little to say upon the subject, but the above quantity is only a starting point. If it were not so there need be no fear, for the probable quantity of 83,000,000,000 tuns of coal in the mines of the United Kingdom, at a depth of not more than 4,000 feet, would would keep us going for another 835 years, a period equal to that which has elapsed since the Norman conquest. But the coal consumption is not stationary, as shown by the following table:

Year.	Coal raised, Tuns.	Coal exported, Tuns.
1854	64,600,000	4,300,000
1855	61,400,000	4,900,000
1856	66,600,000	5,800,000
1857	65 300,000	6,700,000
1858	65,000,000	6,500,000
1859	71,900,000	7,000,000
1860	83,200,000	7,400,000
1861	85,600,000	7,200,000
1862	83,600,000	7,600,000
1863	88,200,000	7,500,000
1864	92,700,000	8,000,000
1865	98,100,000	8,500,000
1866	101,630,000	9,367,000

Thus in twelve years the consumption of coal has advanced rapidly, and in all directions it is easy to see how that consumption tends to increase. Small engines, among other things, are daily creeping more into use, and he thought it likely that the day was not far distant when nearly every house would have its own little gas engine to work a sewing machine, or to assist in other household matters. In agriculture there is a growing demand for steam power, which is also wanted for hydraulic purposes, for the water therein need is commonly pumped up by steam. No engines give the full amount of mechanical power contained in burning coal, but even the economizing of coal, strange to say, tends to increase the consumption, for steam power becomes cheaper the less coal the engine consumes, thus increasing the demand for machine power. In common fire grates a vast amount of heat is wasted, and goes up the chimney without doing any good at all; this waste he hoped to see stopped to a very great extent.

Upon examination of the government returns it is seen that trade tends to increase in geometrical and not in arithmetical progression, and the increase of consumption of coal follows the same law, which applies to almost all branches of human industry. The yearly increase in the consumption of coal shows a tendency to follow this law, at which rate of progression the store of coal in the United Kingdom, instead of lasting 800 years, is likely to be used up in a a small fraction of that time. Like the problem of the nails in the horse's shoe in the arithmetic-book, figures mount up in a most surprising manner under the system of geometrical progression. The quantity of coal sent out from England for several centuries has steadily followed this law. In another twelve years, therefore, the anuual demand for British coal is likely to reach 1,000,000,000 tuns, as he (the lecturer) had published in a table some months back, and was much ridiculed for giving such high figures. He did not believe that the coal fields of Great Britain could produce 1,000,000,000 tuns a year, and if this be the fact, industry and trade cannot progress here in the future as in the past. Temporary depressions make a difference in the produce, and 1868 might show a falling off in the coal trade in the same way as in 1855 compared with 1854, but such disturbing influences are only transient. He did not doubt that there is coal at a greater depth than 4,000 feet, but the supply of it will be scanty, and the cost of raising it very heavy.

Lord Russell once sent a circular letter to the consuls to send home figures about the supply of coal in different foreign countries. The totals are here given as accurately as possible:—

Yearly Produce of Coal.

Country.	Tuns.
Great Britain	101,800,000
United States	25,800,000
Zollverein	20,610,000
France	10,710,000
Belgium	9,935,000
Australia	4,500,000
British America (estimated)	1,500,000
Russia (estimated)	1,500,000
Spain	300,000
New South Wales	250,000
Ireland	123,000

Of all the nations in the above table, the United States has the greatest stock of coal, the area of its coal fields being 196,650 square miles, while in Great Britain the area of coal is only 5,400 square miles. Yet, in spite of this disproportion, the United Kingdom gets rid of much more coal annually than all the rest of the world put together.

Sometimes the remark is made that a substitute for coal will be found. The newspapers are fond of repeating proverbs on the point, such, for instance, as "Necessity is the mother of invention," or "Where there's a will there's a way." Proverbs are out of place in the consideration of such a serious subject, moreover the last proverb quoted has no truth in it. Electricity will never supply the place of coal, because the metals burnt by chemical action in all the batteries have first to be smelted by means of the heat of coal, and in the different induction machines, such as Wilde's, for the production of electricity, the driving power is derived from coal. A letter from Prof. Tyndall now before him (the lecturer) said that he saw no prospect of any other large source of heat and power besides coal, and when that is gone we cannot hold our own against other nations. He (Prof. Tyndall) had stated over and over again in his lectures that the future prospects of Great Britain are more in the hands of its coal owners than in the hands of its statesmen. When coal is gone, the heat of the sun and the motion of the tides are the principal sources of power remaining.

Few, said Mr. Jervons, have attempted to form an opinion as to the full meaning of the falling off of our supply of coal. The increase of national wealth depends upon the increase in the consumption of coal, so that when the latter declines, the national life will be shortened. Then the progress of the nation will gradually cease, employment will become scarce, and emigration will set in to a larger extent. There is a possibility that Great Britain will be thus stopped in 100 years from this date, but many other natious, especially the United States, will feel no such check. Yet in 50 or 100 years coal will have become even more indispensable than it is now. What shall we do? Shall we lay a tax upon coal? Shall we stop its exportation? He did not see that we have any right to do either of these things. Mr. John Stuart Mill, the great political economist of the age, says that while thinking of the loss of coal, we ought to connect with it the fact of the national debt. Supposing a colliery proprietor to be heavily in debt, and to possess the knowledge that in course of years his mines would be exhausted, he would at once begin to capitalize. The British nation ought to do the same and try and pay off its debt in the days of prosperity. Mr. Jevons thought this course should be taken also; better still that the population of the country should be thoroughly educated to understand these and other vital questions, and to get rid of those laws and other causes which now produce pauperism; thus he thought the public would be better prepared than at present for the days of trouble. It must not be forgotten that Mr. Jevons' conclusions are stoutly disputed by many high authorities. Mr. Jevons overestimates our future rate of consumption, we think.

Prof. Roscoe, F.R.S., is now delivering a Saturday afternoon course of very instructive lectures on chemistry at the Royal Institution, of which lectures we shall have more to say hereafter.

A REMARKABLE MEDICINAL SPRING, on the island of Jamaica, has just been brought to notice. An analysis of the water, which Dr. Attfield reported at the last meeting of the London Pharmaceutical Society, shows that every gallon contains about 3½ ounces of chloride of calcium, 2 ounces of salt, and 2½ grains of chloride of ammonium. The proportion of chloride of calcium, Dr. Attfield believed to be unprecedented. The therapeutic action of this salt is most useful for the treatment of scrofulous affections, and glandular swellings, a fact known to the negroes on the island, who have valued and used the water for medicinal purposes upwards of forty years.

Marine Paint.

This paint is produced by incorporating a pasty mixture of white lead and boiled linseed oil with a pasty solution of caoutchouc, or gutta percha, and a sufficient proportion of boiled linseed oil to reduce the mixture to a proper condition to be spread with a brush upon wooden, metallic, or canvas surfaces. The best paint is produced by the combination of a pasty mixture of white lead and boiled linseed oil with about an equal portion of a pasty solution of caoutchouc, or gutta percha, and a sufficient quantity of boiled linseed oil to reduce the paint to the desired working condition. The caouutchouc, or gutta percha, may be reduced to a pasty condition by the use of naphtha oil. The surface produced by the use of my improved paint is remarkably adhesive, tough, elastic, and durable, when exposed to the action of air or water. When the bottoms of marine vessels have been thoroughly and sufficiently coated it has been found to prevent the attachment thereto of barnacles and other parasitical or vegetable growths, and also the ravages of the teredo, or "borer." Patented by Gilman Hook, West Harwich, Mass.

CLARKE'S PATENT FILE FOR PAPERS, MUSIC, ETC.

So many journals, the value of which is not exhausted by a first reading, are now published in quarto form, requiring to be cut for convenience in reading, that a file or temporary binding is a great convenience. By this means the papers can be kept clean and free from folds and creases, ready for the binder when the volume is completed. The cheap construction, however, of some and the unhandiness of others are objections to their use. The one illustrated in the engraving appears to be free from these objections, as it is very strongly made and the papers may be readily put in without punching holes or otherwise injuring the sheets. Any required papers may be taken out after filing without disturbing any of the others. The back of the binder is a plate of stiff sheet metal of a width sufficient to hold the weekly issues of six months to form a volume, and it is secured on each side of its whole length to wing sheets, by a hinge formed the whole length of the plate. These wing plates, being solidly secured to the lids of the file, make the device very strong.

Fig. 1

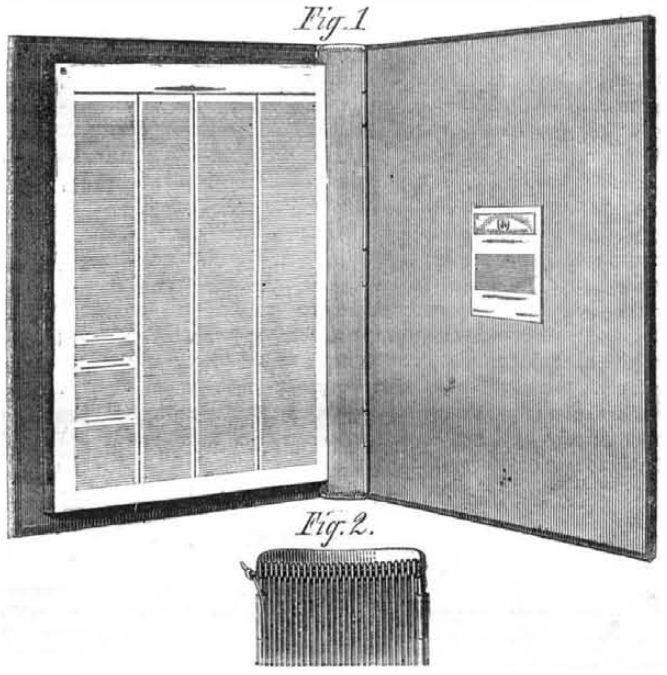


Fig. 2.

Each end of the back plate is formed into a comb of backward bent teeth, between the interstices of which are introduced pieces of elastic cord knotted at each end to hold them in place. This arrangement is shown plainly in Fig. 2, Fig. 1 showing the file opened and containing papers.

In using the file a paper is opened in the middle and slipped under one of the elastics which, holds it firmly in place. Should one of the cords break it may be replaced in a moment by another, but they last a long time by proper usage.

Patented through the Scientific American Patent Agency, Dec. 3, 1867, by John C. Clarke, who may be addressed, Box 53, or 122 Railroad avenue, Jersey City, N. J.

Consumption and its Cure.

The latest writer on this subject is a Dr. Carl Both, a physician who studied his profession at Göttingen, Würzburg, and Marburg, and who, having made this disease a special study for many years, has published at Boston an explanation of a newly-discovered method of treatment. In regard to the nature of consumption, Dr. Both utterly rejects the notion of hereditary transmission, and finds its cause in imperfect respiration at the time of birth, the formation of tubercles, he asserts, only taking place in those parts of the lungs where respiration has been repressed or has entirely ceased. Our author was convinced that consumption was not, as he had been taught to believe, incurable, from being present at a *post mortem* examination at Würzburg, when he noticed this fact, that tubercles had formed in the subject's lungs, and had healed themselves without any medical treatment. The diseased parts had the appearance of chalk, although the original cells and tissues could be detected by the microscope. From this and other cases of the same kind that came to his knowledge, he made up his mind that if nature could cure consumption by her own processes it was possible to effect the same result by medical treatment. To discover nature's mode of cure was his first object, and after patient study he

© 1868 SCIENTIFIC AMERICAN, INC.

finally became convinced that this process was the calcification of the diseased parts by means of lime furnished by the blood, and on this discovery he bases his method of treatment. Dr. Both does not attempt the expulsion of the diseased cells, but allowing them to remain as bad tenants, his object is to cut off all nourishment from them, to incarcerate and thus render them harmless. To attain those objects his first step is to press air into the lungs by natural inspiration powerfully stimulated by certain muscular exercises, which should in every case be taken under the direction of a physician. This causes an increase of coughing, which the doctor regards as a remedial action of nature intended to expand the lungs and expel the diseased matter, and rarely produces any favorable effects before the fourteenth or fifteenth day. He next attempts to purify the blood by regulating the patient's diet. Vegetable acids containing abundance of oxygen are best adapted for this purpose. The next step is to introduce phosphorus and sulphur into the blood, which he does by prescribing a diet in which coarse bread, green corn, mustard, horse radish, etc., figure largely. Lime, silica, and magnesia are likewise introduced by means of diet. The new system is equally efficacious in all climates, in all seasons of the year, and in all conditions of the weather.

Effects of Light on Vitality.

In a remarkable paper addressed to the French Academy of Sciences, Dr. Dubrunfaut examines the effects of light on vegetable and animal life. The researches of MM. Gratiolet, Cloëz, and Cailletet have in a great measure proved that the red rays of the luminous spectre are those to which the important physiological function exercised by the sun on plants is to be exclusively attributed. The leaves in this case act as analysers of white light; they reject the green rays, which constitute the physical complement of the red ones; and it is thus the various hues under which the organs of vegetation are seen by us may be explained. If plants were exposed to green illumination only, that would be tantamount to their being in the dark. But this kind of light, which the vegetable kingdom refuses to absorb, is precisely that which is coveted by the animal one. Red, the complementary color of green, is that which, owing to the blood, tinges the skin of the healthy human subject, just as the green color of leaves is the complement of the one they absorb. From this principle, so fully established by experiment, M. Dubrunfadt passes to its practical application to domestic life. All kinds of red should be proscribed from our furniture, except curtains. Our clothes, which in point of fact play the part of screens, should never be green, while this color, on the contrary, should predominate in our furniture, its complementary one being reserved for our raiment. In the same way he contends that the salubrious influence of woods and forests is a luminous, and not a chymical effect. In support of these views he mentions cases of patients whose broken constitutions were restored merely by long exposure to the sun in gardens deprived of trees or other obstacles to light; he quotes the instance of four children that had become chlorotic by living constantly in one of the narrow streets of Paris, and that regained their health under the beneficial influence of the solar rays on a sandy sea coast.

Telegraphy in Switzerland.—The reduction of the tariff upon telegrams in Switzerland, to a uniform charge of half a franc (ten cents) a message, has not proved the failure that many anticipated. In January, 1867, the number of dispatches throughout the country was 50,513, against 86,461 for the same period in the present year. A comparison of the amount received will show that the revenue has not diminished in consequence of the reduced tariff: In January, 1867, the receipts were about $11,900, against $13,060, during the same period this year.

Natural Illuminating Gas.—The New Orleans gas company seem likely to find a formidable competition in the sources of natural gas, which have been discovered in several places near the city. It is only necessary to sink an iron tube to a depth of forty feet, when the gas begins to flow out with great steadiness, at the rate of five feet per hour, and is accumulated in suitable reservoirs. The natural gas burns with a clear, white flame, equal, it is said, to the best purified coal gas.

Hair Curling Liquid.—Some of our straight-haired young lady friends, who are troubled to coax their locks into the prevailing frizzy style, are advised to try the following recipe: Take borax, two ounces; gum arabic, one drachm; add hot water (not boiling), one quart; stir, and as soon as the ingredients are dissolved add three tablespoonsful of strong spirits of camphor. On retiring to rest wet the hair with the above liquid, and roll it in twists of paper, as usual.

Pimples and Face Worms.—The following is for the benefit of our young gentleman readers: The most simple cure for eruptions on the face is to bathe it twice or thrice a day with camphor spirits. As these eruptions are caused by the impurity of the blood, perhaps the best plan would be to consult a physician. Flesh worms may be eradicated by taking every evening, for a few weeks, as much sulphur as will cover the blade of a penknife.

Doctor Pollion, of France, recommends the inhaling of hartshorn for curing colds in the head. The inhalation by the nose he recommends seven or eight times in five minutes. We have frequently used spirits of camphor in the same manner with beneficial results.

So far as the solid earth or the unstable sea is concerned, man is king; but he has yet to conquer the ocean of air above him.

MANUFACTURING MINING, AND RAILROAD ITEMS.

The first through train from New York to Sioux City reached that point on the 30th ult., having left the former place nine days previous, loaded with goods for Montana. Sioux City is 1,040 miles above St. Louis, so that precisely that amount of precarious steamboating is saved to the Montana trade.

An English inventor has patented the following simple plan for casting ingots of steel or other metal to any given weight. For this purpose the ingot mold is placed upon the table of a weighing machine, or upon a table supported by a spring balance; the ingot mold and everything in connection with it, is then weighed. By adding the weight of the ingot to be cast to the weight of the ingot mold and its accessories, he is enabled to make the ingot of any given and desired weight.

The directors of the Union Pacific Railroad Company have decided definitely upon the location of the great suspension bridge across the Missouri river. The point selected is where the line of the old Missouri and Mississippi railroad strikes the river, directly between the cities of Council Bluffs and Omaha. The estimated cost of the bridge is over $2,500,000, and its construction makes Council Bluffs the great railroad center of the West, much to the disgust of other competing towns, who earnestly desired the important position as the great distributing point for the eastern trade.

The Pacific Mills, of Lawrence, began operations in 1853. They now contain 100,000 spindles for cotton, with carding, picking, and cleaning machines, 16,000 spindles for worsted goods, and 18 printing machines. The machinery is driven by eight turbine wheels, two of which are 84 inches in diameter. The weekly production of goods is about 700,000 yards, and the sales about 7,500.000 per year. The company are now employing about 3,600 hands.

An oil establishment at Moabit, near Berlin, Prussia, by means of the bisulphide of carbon, are daily extracting six thousand pounds of oil, of sufficiently good quality to be employed in lubricating machinery. Colza and linseed are the materials employed, the residue serving well to feed cattle with. Analysis has shown that only 2 per cent of the oil and 7 per cent of water remain after this new mode of treatment, while the residues of the ordinary pressure powers, contain 9 per cent of oil and 15 per cent of water.

The plumbago mines of Canada are represented to be one of the most important of the mineral productions which the new Dominion possesses. Several companies are conducting operations on an extensive scale in the county of Ottawa, and many others will be organized the coming season. The extent of the plumbaginous deposits in the crystalline rocks is said to be very large; the deposits, however, are intersected in some districts with a calcareous formation, from which the plumbago is not easily separated. Plumbago finds an employment in the various arts and manufactures to a far greater extent than is commonly supposed, the cities of Boston and New York alone consuming upwards of ten thousand tuns annually. Hitherto, the greater part of this supply has been imported from Germany and Ceylon, but the time may not be far distant when the Canadian mines, will fully supply the entire American market.

Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents.

Double Drawbridge.—T. S. Speakman, Camden, N. J.—In this invention the bridge is widened at the draw and provided with two tracks or ways across the channel, so arranged and operating that a vessel passing the bridge cannot for a moment obstruct the travel across it.

Composition for Covering Wooden Bridges, Buildings, etc.—J. Heckel and Michael Eichinger, Decatur, Ill.—The object of this invention is to protect wooden structures from fire, and to preserve them from decay, resulting from the action of the weather, moisture, etc.

Portable Gas Generating Apparatus.—Wm. M. Sloan, Buffalo, N. Y.—This invention consists, first, in providing within the carbureting chamber a floating vessel having a felt bottom, for the purposes hereinafter shown and, secondly, in heating steam or air that has been carbureted, and thereby fixing it as a gas.

Device for Moving Cabs.—J. Douglass, McConnellstown, Pa.—The object of this invention is to furnish a cheap, durable, and convenient portable instrument, by which heavy cars can be started and moved along the track by hand without difficulty, whether the track be inclined or level.

Portable Head Rest for Railroad Car Seats.—R. W. Haywood, Baltimore, Md.—In this invention a hinged adjustable standard which supports the cushion or head rest is so operated by a regulating screw that it can be made to assume any position in relation to the back of the seat, which may be most convenient for the person occupying the seat.

Well Tube.—Wm. Martin, Tarr Farm, Venango county, Pa.—In this invention the point has two ears by which it is attached to the upper part of the tube, the latter having a longitudinal slot under the ears through which it is riveted to them. While the well tube is driving into the ground, the lower end of the cylindrical tube steps in a socket in the upper end of the conical point; and when the well has been sunk to the required depth, the upper part of the tube is raised so as to allow the water to enter.

Horse Collar.—Ira Houghtling, Houghton, Mich.—This invention relates to an improvement in horse collars, and consists in forming the collar of india rubber, wood, or any other suitable material, with holes running through it from back to front, in any direction, to make it light and elastic.

Combined Musical Reed and Return Ball.—John Burke, Brooklyn, N. Y.—This invention has for its object to furnish an improved toy for children, which shall be so formed as to combine two toys in one, without affecting the efficiency of either.

Connecting Link.—Wm. N. Pelton, New London, Conn.—This invention relates to a new connecting link for chains and other purposes, and consists in the use of a link in which a portion is hinged to the body, and can be fastened with its free end by means of a pin to the same.

Sofa Bedstead.—Julius Werner, New York city.—This invention relates to a new sofa which is so arranged that its seat can be folded out and that its back can be folded into the place of the original seat, so that thereby a bed bottom of double the width of the original sofa seat can be obtained.

Conveyor for Grain, etc.—J. M. Rush, Marengo, Iowa.—This invention relates to an improvement in the construction of a conveyor for feeding grain into a set of millstones or an elevator, or for other similar purposes.

Balanced Slide Valve.—Wm. B. Robinson, Detroit, Mich.—This invention relates to a method of packing and balancing the slide valves of steam engines, whereby the pressure of the steam on the face of the valve is counterbalanced and the valve allowed to have a free and easy motion.

Adjustable Valve Rod Connection.—John Robertson, Quincy, Ill.—This invention relates to a method of connecting the valve rod of a steam engine to the eccentric band, whereby the rod may be adjusted to the proper length without turning it round or in any manner disturbing any of the parts connected with it,

Coffin.—Samuel Avery and Lewis Delill, Phœnix, N. Y.—This invention has for its object the construction of wooden coffins in such a manner that they may be readily packed in a small space before being put together, and also so that the sides, or the parts of which the sides are composed, shall require no bending.

Paper Ruling Machine.—Wm. S. Wilder, New York city.—This invention has for its object to furnish a simple, convenient, and accurate paper ruling machine, for ruling bill heads, etc.

Gang Plow.—W. F. Higgins and Jerome Perry, Watsonville, Cal.—This invention has for its object to furnish improved devices for connecting the plow frame to the sulky or wagon frame and for raising and lowering the plow frame and plows, as may be desired.

Bailing Press.—Enoch Taylor, Memphis, Tenn.—This invention has for its object to furnish an improved press for pressing or bailing cotton, hay, tobacco, etc., which shall be strong, durable, simple in construction, and effective in operation.

Ruling Pen.—John H. Holland, Hancock, Mich.—This invention has for its object to furnish an improved ruling pen, so constructed and arranged that it may be adjusted to rule parallel lines at a greater or less distance apart, as may be desired, and so that the pens can be conveniently removed and replaced as required, without inking the fingers.

Apparatus for Heating Apartments.—Felix Walker, Memphis, Tenn.—This invention relates to a new device for heating apartments, and consists chiefly in the use of an egg-shaped stove, set upon a hearth or iron plate which is on a level with the floor, the ashes falling through the plate into a pan arranged under the floor, or through a valve under the floor into any suitable receptacle.

Cabinet Bedstead.—Wm. Dutton, Philadelphia, Pa.—This invention relates to that class of bedsteads which are constructed so as to fold upward and be concealed from view when not in use, and present the appearance of a bookcase or other piece of furniture generally used in sitting or reception rooms. It consists in an improved manner of hanging the bedstead, whereby it may be counterpinned so as to require but a slight effort to raise and lower it. The invention further consists in a novel application of legs or supports to the bedstead, whereby the legs or supports will be automatically folded and unfolded by the raising and lowering of the bedstead, and in such a manner as not to interfere in the least with the application of the hands in manipulating the bedstead.

Portable Fence.—Charles Lee, Sandy Post-office, Ohio.—This invention relates to an improved fence, and consists in clamping the pannels between portable posts by means of blocks and keys, one or more, to each pannel.

Extension Chair.—Bernhard H. Zinn, New York city.—This invention consists of a folding foot rest which is capable of being folded out of the way under the seat of the chair, and also of being raised or lowered to different hights when in use.

Fish Catching Attachment for Vessels.—Thomas Bell, Bellport, N Y.—This invention relates to a fish catching attachment to be applied to vessels, either steamers or those provided with sails. The invention is designed for catching those kinds of fish which swim near the surface of the water, such, for instance, as the mackerel and herring species, and which are caught in large quantities for selling or curing for food, the extraction of oil, and for manure.

Lemon Squeezer.—Thomas C. Smith, New York city.—This invention relates to a lemon squeezer, and is an improvement upon and designed to supersede the ordinary wooden squeezer provided with a porcelain cup or concave and a convex compress. The invention consists in having the body of the device of cast iron or other cast metal, and in the manner of applying the porcelain parts to the same, whereby a very desirable implement of the kind specified is obtained.

Brick Machine.—Clinton Nolan, Niles, Mich.—This invention consists in so constructing the press that it can be lifted over a stone or any other obstruction; also, in so governing the press by a lever as to impart a greater or lesser amount of pressure according to the consistency of the mud; also, in so constructing a rack through which the clay passes before entering the mold or molds, with holes narrower at their center than at their ends in order that a larger amount of clay may be forced into the mold at its front end, producing a brick more equally and evenly pressed in all of its parts and causing the mold to be unevenly filled. Also, in so constructing and shaping the rack with an inclination from each side to the center as to afford the brick, when pressed, an easy egress from the machine. Also, a guide or turnpin for the mold inserting in the machine to strike against, so constructed and arranged as to be susceptible of adjustment for receiving a mold of a greater or lesser length, or to be adapted for the same molds as they become worn from use. Also in constructing the mold to a brick press with a movable bottom or follower.

Top Box or Board.—David Wight, New London, Conn.—This invention relates to a box or board to be used for the playing of a game, which game consists in and is played by spinning a top that is made of an octaginal or other polyginal shape.

Bracelet.—Charles M. Kinsel, Columbus, Ga.—This invention consists in so constructing a bracelet of such class worn as an ornament or jewel upon the wrists of ladies, misses and other persons, that it can be folded up, or, in other words, brought to such a form as to be susceptible of being worn as a finger ring, if so desired, which form of bracelet is intended to be denominated for convenience in trade a "bracelet ring."

Tatting Shuttle.—E. N. Parker, Center Brook P. O. Essex, Conn.—This invention relates to improvements in an instrument used by females in fabricating a kind of trimming called "tatting."

Clothespin.—A. L. Taylor, Springfield, Vt.—This invention relates to an improvement in the ordinary wooded clothespin, those which are provided with rigid prongs formed by slotting a stick of suitable dimensions in a longitudinal direction. It consists in providing such class or kind of clothespin with a catch or fastening arranged or applied in such a manner that the pin will be effectually prevented from casually slipping off from the line and freeing the clothes therefrom, a contingency of frequent occurrence especially in windy weather.

Lining Furnaces.—B. A. Haycock, Richland, Iowa.—This invention relates to a method of lining the fireplace or furnace of stationary steam boilers.

Fire Escape.—Azariah Robinson, New York city.—This invention has for its object a ready means for lowering persons and goods from a burning building, thereby saving life and property. It is applicable to any building or dwelling but is more especially designed for large tenement houses which have a great number of inmates and the conflagration of which is almost invariably attended with loss of life and considerable property.

Lead and Slate Pencil Case.—Thomas B. McCaughan, Memphis, Tenn.—This invention relates to a case for lead and slate pencils, and it consists in having a rod attached to a sliding band on the case and arranged so as to work within a conical or taper ferrule, placed on the end of the case and admit of being shoved or pressed against the lead or slate of which the pencil is composed so as to hold the latter firmly in position when adjusted for use

Apparatus for Raising Sunken Vessels.—Count Arthur Dillon, Paris, France.—This invention relates to certain improvements in pontoons for raising sunken or grounded vessels and consists in constructing the pontoons with an internal cylinder having pistons by the action of which the displacement of the pontoon is augmented or diminished and thus the raising and sinking of the pontoons is effected; also, providing the said pontoons with ballast compartments having trap bottoms for discharging the ballast together with other devices perfecting the whole.

Beater Hay Press.—J. W. Lockhart, Charlestown, Ill.—This invention relates to an improvement in the construction of a beater hay press, and consists in the arrangement of a drop beater in connection with a horse power and operated by means of a rope and pulleys.

Process for Extracting Gold.—Rudolph d'Heurense, San Francisco Cal.—This invention relates to a method of extracting and separating gold from the foreign matter, or particles with which it may be combined, and consists in subjecting gold bearing substances to the action of melted zinc.

Machine for Picking Hair.—Ernest Hoffstaetter, New York city.—This invention relates to a machine for picking hair and cleansing it from dust and dirt.

Sap Spile.—Williston Conner, Rensselaerville, N, Y.—This invention has for its object to furnish an improved sap spile, simple in construction, effective in operation, and which can be manufactured and sold for a very small amount.

Planers.—Thomas Tostevin, Council Bluffs, Iowa.—This invention has for its object to furnish an improvement in the construction of the cutters and caps of plauer heads, whereby the first cost will be diminished, less grinding will be necessary to keep them in order, and the efficiency of the planers will be increased.

Bedsteads.—Wm. L. Thomas, Middlebury, Ohio.—This invention has for its object to furnish an improved bedstead, so constructed and arranged that the head part of the bed may be raised much or little, to vary the position of the person lying upon the said bed, as desired.

© 1868 SCIENTIFIC AMERICAN, INC.

STOVES.—Joseph Collins and John Knox, Conshohocken, Pa.—This invention relates to a method of constructing stoves, whereby they are rendered suitable not only for cooking, but for heating purposes.

STEREOSCOPE.—W. M. Kohl, Cincinnati, Ohio.—This invention relates to a stereoscope or stereoscopic box, and consists in a new and improved application of the lenses to the box, whereby the former may be adjusted in two different directions, in order to obtain a proper focal distance and to suit the width of the pictures. Also, in an improvement pertaining to the scene or picture holder.

DEVICE FOR CONVERTING MOTION.—M. M. Follett, Westboro, Mass.—The nature of this invention relates to a novel means of changing reciprocating motion into rotary motion, or rotary motion into reciprocating, and at the same time changing the relative velocities of the parts having the two different movements.

COMBS.—Josiah S. Dickinson, Essex, Conn.—This invention consists in the combination of a detachable comb plate with a holder, whereby the former can be readily moved from the holder when dirty or broken, and a new comb plate affixed in the said holder instead.

MOP WRINGERS.—M. M. Follett, Westboro, Mass.—This invention relates to an improvement in mop wringers, whereby the same may be more readily adjusted to the pail or tub, and securely fastened to the same, and at the same time providing a ready means of detachment, so as to substitute one tub or pail for another.

STILT SKATE.—Wm. Jordan, Galena, Ill.—This invention relates to improvements in stilt skates, and consists in so constructing them that the elevated shoe is jointed to the vertical connection of the runner, and the support for the leg, in a manner to make a very convenient, light, and graceful stilt skates. In this improvement the foot piece of the skate is detached from the runner and elevated above the same by a jointed connection, and provided with vertical extensions for securing to the side of the leg nearly as high as the knee, whereby a very graceful, light and superior stilt skate is provided.

SAWING MACHINE.—John L. Knowlton, Philadelphia, Pa.—This invention relates to a machine for sawing timber, in straight, curved, or beveled form, and is an improvement on a machine for the same purpose patented October 20, 1863. The object of the present invention is to render the machine better adapted for the sawing of crooked or curved timber, such as is used for ship building, and while effecting this result, to obtain simplicity in construction, a greater facility of manipulation, and a less cumbersome machine than usual.

FANNING CHAIR.—Augustus R. Hobbs, Elizabethport, N. J.—This invention relates to a method of constructing chairs, whereby the same are convertible at pleasure into rocking or fixed chairs, and whereby a fan is made to rotate by the rocking of the chair, thereby greatly increasing the comfort of the occupant.

BREECH-LOADING FIRE-ARMS.—Charles H. Allsop, Middletown, Conn.—This invention consists in a novel manner of constructing the breech, and applying the barrels thereto, and in a peculiar fastening or catch for the barrels, whereby the piece may be loaded or charged with the greatest facility, and the parts rendered very permanent and durable.

HOT AIR FURNACE.—H. G. Burr, Minneapolis, Minn.—This invention relates to a method of constructing hot air furnaces for warming buildings, and it consists in an arrangement of vertical flues and tubes, and horizontal plates, whereby the heat radiating surface of the furnace is greatly increased.

FLUTE.—Theodore Berteling, New York city.—This invention relates to the supplying of the keys of flutes or similar musical instruments, with adjustable regulating screws, for the purpose of regulating the throw or lift of the keys. Where a note is required to be repeatedly played, the cushions on the lower surfaces of the keys are apt to become flattened, and the instrument is thereby caused to fail to sound according to the wish of the operator.

MACHINERY FOR THE MANUFACTURE OF GUNPOWDER.—Paul A. Oliver, New York city.—This invention relates to a machine for combining and incorporating the ingredients of which gunpowder is composed, and also for granulating or separating into small lumps the mass of powder compressed in cakey form, by the combining and incorporating of the ingredients. The object of the invention is to obtain an economical device whereby the above result may be obtained within a comparatively small compass, and one which will be continuous in its operation. The present Chilian mill which is now used for the purpose, being very cumbersome and expensive, and not continuous in its operation.

FISH TRAP.—Thomas B. McCaughan, Moscow, Tenn.—This invention relates to a device for catching or hooking fish, and is designed to be used in connection with a set line. It is a common practice with fishermen, in many localities, to bait hooks, and have the lines attached to a pole or rod sunk into the bed of the river or creek, or into the bank at the side of the same. the lines being visited at suitable intervals, and the fish, if any, be caught, drawn out of the water, the hooks rebated, and again thrown into the stream or creek. The fish very frequently succeed in taking the bait from the hooks of these set lines without being hooked, on account of the absence of any jerk or pull when they seize the bait; and the object of the present invention is to overcome that objection attending the use of set lines.

SAFETY LOCK FOR HARVESTER.—Stephen Rex, Orefield, Pa.—The object of this invention is to accomplish the instantaneous locking of a reaping or mowing machine, when the driver shall fall therefrom; and thereby prevent any injury to the driver from the cutters or knives of the machine. It consists of a pawl catch and lever for lifting the same from the teeth of the main gear wheel, with other devices perfecting the operation.

Answers to Correspondents.

CORRESPONDENTS who expect to receive answers to their letters must, in all cases, sign their names. We have a right to know those who seek information from us; besides, as sometimes happens, we may prefer to address the correspondent by mail.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however when paid for as advertisemets at $1 00 a line, under the head of "Business and Personal."

☞ *All reference to back numbers should be by volume and page.*

TO CORRESPONDENTS.—Once more we ask the attention of our correspondents to the necessity of giving their name and address. Many letters require a reply by mail when answers to the inquiry will not probably interest a large number of readers, which we are unable to give when the signature is "Young Mechanic," "Constant Reader," etc. Nor can we direct to "Smithville," when there is no State given and there are fifteen post offices in the country bearing that euphonious title. Careless correspondents need not expect attention paid to their letters. Neither will answers be given when the same inquiry has been replied to in correspondent column recently.

J. B., of Wis.—"I have now a 10 by 24-inch cylinder to my engine running 100 revolutions per minute with 100 lbs steam; have boiler enough to make steam freely. I am putting in a 12 by 24-inch cylinder which I propose to run at 90 revolutions with 75 or 80 lbs. of steam. Some affirm I shall not be able to get steam from the boiler at 75 lbs., and others that if I do get the steam I shall not have the power the old cylinder yielded." Your engine with cylinder 10 by 24 inches at 100 revolutions with a pressure of 100 lbs. on the piston will give 95·2 H. P. The engine 12 by 24 inches at 90 revolutions and 75 lbs. of steam will yield 92·47 H P. The same cylinder with 80 lbs. on the piston will give 98·64 H P.

L. D. Y., of N. Y., thinks the proposals for a bridge between New York and Brooklyn cities should be made to the engineers of the whole country, the governments of the respective cities offering a certain sum, etc., for the best plan. We believe that the bridge company advertised for proposals which were open to all to answer, and that the company has already adopted the plan o John A. Roebling, which plan will probably be soon in process of execution.

N. G. G., of Nebraska.—What would be the relative effect of equal weights attached to the periphery of pulleys of unequal diameter connected by a belt, say let one pulley be one foot in diameter and the other two feet?" There would be no difference in the power exerted by the weights if there was no slipping of the belt.

E. S. B., of N. Y.—"The best method of applying gold leaf to drawing paper or Bristol board for illuminated lettering." Gold leaf is applied to almost all substances by means of "size," easily obtained at any store for artists' materials.

M. C., of Ky.—The metal used for the body of an electrotype is common type metal. The shell or copper face of an electrotype is precipitated by electricity from a solution of sulphate of copper or blue vitriol, the metallic strength of which is maintained by a bar or plate of pure copper which is suspended in the solution and is connected by a wire with the negative pole of a galvanic battery.

J. McE.—"Is soapstone packing injurious to the piston rod of a steam engine? , . Where can I get an oil can like those used on locomotive engines?" We have never used soapstone packing, and cannot inform you as to its effect on piston rods. We judge, however, that its use would not be advantageous. Any railway supply store will furnish the oil can.

S. G. M., of N. Y.—Borax for welding or any other purpose is easily dissolved in water. So dissolved it is frequently used for welding iron and steel. As a paste it is as easily applied as when a powder.

C. C. H., of Ky.—In regard to the comparative merits of plowing and spading for agricultural purposes, we believe that practical men prefer the latter because of the better pulverization of the soil.

W. E. B., of Pa.—Sperm oil we consider preferable to other oils for use on an oil stone. We know of no ink in common use not in some measure injurious to steel pens. An acid is a component to the writing fluids generally used, which will attack steel. The best remedy against corrosion of the pen is to clean it as soon as it has been used.

J. R., of Ohio, and J. L. B., of Ky.—You can obtain parafine (not paraffine oil) to prevent oil from rusting at a petroleum refinery; or, in the form of paraffine candles at a grocery. It is the best substance for the purpose we knew of.

T. S., of N. Y.—You will find nothing better for a mold for your brass model than common molder's sand, which you may obtain cheaply at any brass or iron foundery. Common sand will not answer the purpose.

L. B., of Mass., recommends plaster of Paris as a means of "chucking" articles to be turned or bored. The face plate should be slightly rusty and the article properly secured to it by bolts or any other means, and when true and in place, the plaster should be laid around the edge, uniting the piece to the face plate or chuck. It will hold the work firmly.

T. P. N., of Conn., asks "why there is no manufactory in this country for the finer qualities of porcelain ware. We have large deposits of kaolin of excellent quality, etc. Is there any work that shows by diagrams the machinery for this manufacture?" There are deposits of good material in this country for this manufacture, and the reason why they are not used is because they can be made in Europe to better advantage, labor being cheaper than here. The Cartlidge Porcelain Works at Greenpoint made beautiful ware some years ago but the enterprise proved unprofitable. We cannot give you the title of such a work as you desire.

W. Y., of Mo.—White wax may be colored red, blue, or any other tint by boiling ordinary dye stuffs in it and decanting the wax while fluid.

A. S., of St. Petersburg, Russia, asks how to deodorize barrels that have contained peninsular (petroleum) kerosene to make them fit for brandy or spirits. We have before replied to a similar question that we know of no effective process.

W. H. B., of S. C.—The advertising columns of the SCIENTIFIC AMERICAN will inform you of roofing paints which claim to make tin roofs water tight.

A. M. S., of Mass., desires to know how to cut small mirrors from the fragments of larger ones without injury to the reflecting amalgam which is invariably shattered on the breaking of the glass after cutting. We think it probable that a solution of albumen or rubber flowed over the amalgam and dried before cutting will be effective.

H. M., of Minn.—"J. W. H., on page 39, current volume asks if it will take more power to grind eight bushels of wheat in the same time on a four feet run of stone than on one of three feet. I think it will take less power to do the work on the four feet run, as the velocity required to make the smaller stone equal in capacity the larger absorbs a large proportion of the power." "Pallett's Miller and Millwright" can be obtained of H. C. Baird, 406 Walnut street, Philadelphia, Pa.

E. E. S., of N. Y.—"What is the easiest and surest way to make ordinary pencil manuscript indellible? Is there any chemical substance, powder, or solution which may be applied by passing a sponge or cloth once or twice over the writing with a certainty of securing the desired result? If so, what is it and where may it be obtained?" See "Answers to Correspondents," "A. F. T., of Wis.," page 231, current volume.

R. L. M., of Me.—Better advertise in our "Business and Personal."

J. A. W., of Ohio, says the feed water of his boiler contains a large proportion of carbonate of lime which incrusts the iron, and he has thrown the sawdust of his mill into the pool from which the boiler is fed, the effect being to change the color of the water and loosening of the scale. He asks if the sawdust (poplar wood) contains an acid injurious to the iron. We think not, or what it has will combine with the lime rather than attack the iron. The use of woods of various kinds to prevent boiler incrustations has long been known. Logwood is extensively employed for this purpose, and forms the basis of some of the popular patented anti-incrustation compounds. The utility of these woods to prevent incrustation is supposed to be due to the presence of pyroligneous acid, which dissolves the carbonate of lime and prevents its deposition. Chestnut, poplar, willow, and alder woods are richer in pyroligneous acid than logwood. Although destructive to iron, this acid is neutralized by the carbonate of lime, so that a boiler will be kept clean and suffer no injury unless too much acid is present. A small quantity of sawdust in a boiler is usually sufficient to keep it clear of carbonate of lime deposits.

T. H., of Ohio.—If you wish to ascertain whether centrifugal motion affects gravity it may be done by suspending two equal weights to the two ends of a cord and tying the middle of the cord to the hook of a spring balance. Weigh the suspended balls when at rest, then twist the cords together tightly and allow the weights to fly apart and while they are performing their circular motion note the variations of the index of the balance.

J. P., of R. I.—We believe no solder has yet been made which will permanently unite pieces of aluminum bronze.

"Subscribers," North Adams.—"Water is brought into this place from a fountain. It is carried in an iron pipe of 6 inch caliber down grade about half a mile, falling say 75 feet, then goes up grade about half as far, rising some 60 feet. Then it goes down again on 20° inclination about 60 feet; then over undulating ground half a mile. At the 60 feet summit the 6-inch pipe stops and one of four inches diameter is laid. Of course it cannot receive the water from the 6-inch pipe. 1st. How far should the 6-inch pipe go over the hill to have the increased velocity of the water so lessen the volume as to have it enter the 4-inch pipe without any obstruction? 2d. How much more water would pass through the 6-inch pipe by passing around the 60-feet rise than by passing over it? 3d. What would be the difference in the quantity of the water if it were discharged before it began to rise the first hill and the quantity that would pass over the hill?" We apprehend that the difficulty alluded to in the first question might be overcome by a joint pipe of suitable length, tapering from 6 inches diameter on one end to one of 4 inches on the other extremity. The arrangement proposed in the second question would not affect the obtainable supply at all. The third question you can best answer yourselves bear in mind that the amount of water flowing from an opening will in this case depend on the area of the cross section of the opening, its perpendicular distance from the level of the fountain, and the pressure under which the column of water issues from the fountain.

C. S., of Mass.—Look through a file of the SCIENTIFIC AMERICAN and you will find full particulars about the properties and manufacture of gun cotton. We cannot afford the room to reply to individual inquiries on subjects that have been repeatedly answered in this column.

Business and Personal.

The charge for insertion under this head is one dollar a line.

The surest detective of low and high water, and high steam in boilers yet invented. Springer, Hess & Co., Philadelphia, Pa.

Henry Carey Baird, Industrial Publisher, 406 Walnut street, Philadelphia, Pa., has just published "A Practical Guide for Puddling Iron and Steel." By Ed. Urbin, Engineer. A prize Essay read before the Association of Engineers, graduate of the School of Mines of Liege, Belgium. To which is added a comparison of the resisting properties of iron and steel. By A. Brull. From the French, by A. A. Fesquet. 8vo. $1. By mail free of postage.

Capital wanted to extend the manufacturing facilities of one of the established best family sewing machines now sold. Address "Proprietors," box 1442, New York Postoffice. Or would contract with a desirable manufacturer.

There are now in actual operation eight thousand of Ashcroft's Low-Water Detectors. John Ashcroft, 50 John st., New York.

Tube Well—Best in Use.—Patented in 1865. State, County, and Town Rights for sale. Send for circular and prices. Address Dutton & Maguire, Port Jervis, N. Y.

Parties wishing to Manufacture the Hollen Knitting Machine on royalty, or who would supply a Company with machines, address Todd & Duncan, Bellefonte, Pa.

Henry Carey Baird, Industrial Publisher, 406 Walnut st., Philadelphia, has just issued a new and much enlarged descriptive Catalogue of Practical and Scientific Books, 56 pages, 8vo, now the largest list of this character, comprising only the Publications of any one house in either the United States or Great Britain. It will be sent free of postage to any one who will favor him with his address. Every reader of the Scientific American is invited to send for it.

Coal-oil Works, revolving retorts and refinery, lately erected, for sale. Address, on the premises, John White, Darlington, Beaver Co Pa., or C. G. Waterbury, 116 Wall st., New York.

Mill-stone Dressing and Glaziers' Diamonds. Also, for all Mechanical purposes. Send stamp for circular. John Dickinson, 64 Nassau st., New York.

To insure the safety of your steam boilers, property, and life, apply Ashcroft's Low-water detector. John Ashcroft, 50 John st., N. Y.

For Improved Lathe Dogs and Machinists' Clamps, address, for Circular, C. W. Le Count, South Norwalk, Conn.

Bartlett's Reversible Sewing Machines are the lowest priced reliable machines. Are used by hand or foot. 569 Broadway, N. Y.

Black Gypsum—where can it be found in quantities so as to be worked? Parties that can furnish the article address E. E. Hendrick, Car bondale, Pa.

Paper Makers, Tanners, etc., wanting the Best and Cheapest Pump in use will send for Circular to Heald, Sisco & Co., at Baldwinsville, N. Y. Agents wanted.

Parties desiring the best Molding Machines in the market, should address H. A. Lee, Worcester, Mass.

Wanted—the address of Plow makers, out of New England, who would like to introduce, without risk or advanced expense, the best Plow in the market. Address Solomon Mead, New Haven, Conn.

Manufacturers of Iron Pipe and Hydrants please send weight, prices, etc., to G. W. Pearsons, Ogdensburgh, N. Y.

For Sale—A Toy Engine with copper boiler. Price $1. For Photograph and description, send 25c. to Box 597, Gloucester, Mass.

Paper Collar Machine, Improved Style. Also, an improved Machine for plaiting linen and Cotton Bosoms, at the cor. Union and Fulton sts., Troy, N. Y.

Manufacturers of soda water apparatus send circular to box 179, Cape Vincent, N. Y.

Makers of spring movements, for running light machinery, address, stating terms, etc., C. King, 1 King's Place, Albany, N. Y.

C. De P. Field, No. 21 E. 26th st., wishes the address of the maker of the electric lamp recently noticed in these columns.

$500 will be paid for a method of coating large chill rolls, which, upon trial, will be found to overcome the danger of breakage in casting. Address Lock Box 304, Pittsburgh, Pa.

Inventors or manufacturers of machinery for making wrought flap and strap hinges will please address X. Y. Z., Lock Box No. 236 Providence, R. I.

Wanted—A model shuttle sewing machine, to serve as a model for making a cheap shuttle machine to be run either by hand, or with table and treadle—to be manufactured in a foreign country. Address Amos C. P. Poncier, Boston, Mass., describing machine and stating terms, etc.

Henry Carey Baird, Industrial Publisher, 406 Walnut street, Philadelphia, has just published:—"Painter, Gilder, and Varnisher's Companion: Containing rules and regulations in everything relating to the arts of painting, gilding, varnishing, and glass staining, with directions for graining, marbling, sign writing, and gilding on glass. To which are added complete instructions for coach painting and varnishing. A new edition 12mo, cloth, $1 50. By mail free of postage.

EXTENSION NOTICES.

George A. Leighton, of Lawrence, Mass., having petitioned for the extension of a patent granted to him the 11th day of July, 1854, for an improvement in sewing machines, for seven years from the expiration of said patent, which takes place on the 11th day of July, 1868, it is ordered that the said petition be heard at the Patent Office on Monday the 22d day of June next.

Henry Outcalt, of Wilmington, Ohio, having petitioned for the extension of a patent granted to him the 11th day of July, 1854, for an improvement in mode of constructing metallic roofing, for seven years from the expiration of said patent, which takes place on the 11th day of July, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 22d day of June next.

Jonathan Ball, of Elmira, N. Y., having petitioned for the extension of a patent granted to him the 11th day of July, 1854, for an improvement in mode of connecting water pipes, for seven years from the expiration of said patent, which takes place 11th day of July, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 22d day of June next

© 1868 SCIENTIFIC AMERICAN, INC.

Device for Harvesting Clover Seed.

Since the introduction of mowing machines they have been applied to other than their legitimate or primary purposes, with good results in most cases. But for some purposes, a different machine is preferable. The grain cradle and the hand scythe have become almost things of the past. For harvesting clover seed, however, they are better than the mowing machine; but the simple implement shown in the accompanying engraving is specially adapted to this work. The labor of mowing clover and collecting seven or eight tuns of straw for the small amount of seed for which the work was performed, is useless, and improvident; for the straw or stalks should be left on the land for the protection of the roots during the winter and for the enrichment of the soil.

The machine herewith illustrated removes only the heads of the clover, leaving the straw, where it should be, on the ground. It will not collect a particle of other seed, such as that of the ragweed—a great pest to farmers—but takes only the seed heads of the clover. The action of the mowing machine or of the scythe jars the seeds from the heads, when they are fully ripe, wasting large amounts of the former, which waste is greatly enhanced by after handling. This machine, however, collects all the seed on the site of its growth without any waste whatever.

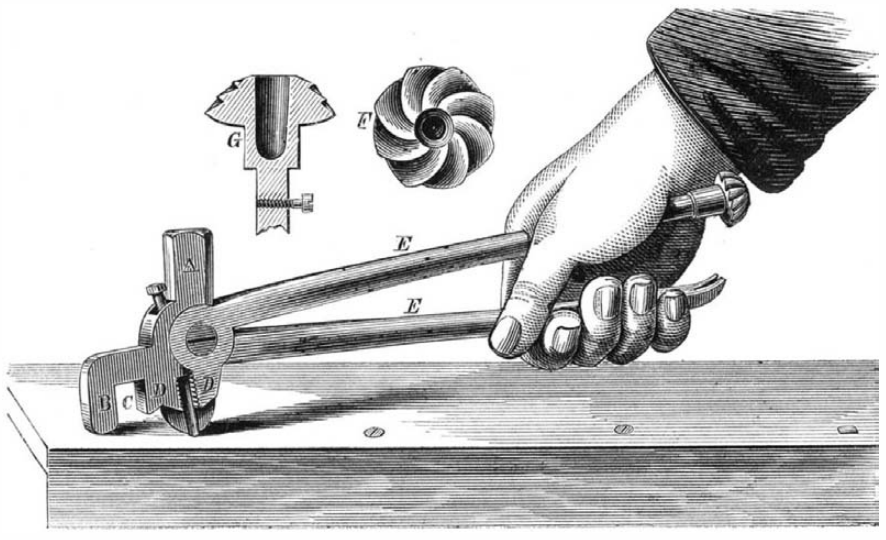
STOCKSTILL & SCARFF'S PATENT CLOVER SEED HARVESTER.

It may be drawn by a single horse, driven by a boy, the forward movement of the machine giving motion to the gatherer, while a reverse or backward motion has no actuating effect, the driving wheels being connected with the shaft by spring ratchets. The front of the machine is a series of semi-cylindrical fingers, concave on their upper surface, for the reception of the heads, a traveler having a reciprocating motion by means of eccentrics, cranks, or other suitable device, passing over the fingers from front to rear, throwing the seed heads back into the body of the machine as it moves forward. To facilitate this delivery a plate on the under side of the traveler receives a transverse oscillating motion by means of pins engaging with zigzag slots in one, two, or more of the fingers, by which the heads of clover are effectually thrown back from the fingers into the body of the vehicle. A simple device of drop latches or cams raises the traveler above the fingers on its forward stroke and allows it to slide closely over their tops on its backward movement. An elevating bar in front and on one side of the driver enables him to graduate the hight of the gatherer to the hight of the clover. From the foregoing any practical farmer may readily understand the construction and operation of this machine.

Patented through the Scientific American Patent Agency, Feb. 25, 1868, by S. L. Stockstill and Wm. H. H. Scarff who may be addressed for rights, etc., at Medway, Ohio.

Improved Combination Hammer, Nail Drawer, Forceps, etc.

The tool which the engraving represents is one of those implements which are intended to combine the offices of various separate tools, and which are so much affected by our inventors. In one implement is combined a number, the whole combination being light, portable, and handy. It is a tool which will find a place of usefulness in the shop of the mechanic, the home of the farmer, in stores where boxes of goods are to be opened, and in almost every place where mechanical work is performed.



COMSTOCK'S COMBINATION IMPLEMENT.

Its construction is similar to that of the forceps, tongs, or pliers, A being a hammer head; B, a fulcrum; the space, C, a wrench; D, corrugated jaws for grasping and drawing nails; and E, the handles or levers. At the end of one of the handles is an ordinary claw for drawing tacks, etc., and the end of the other may be formed into a screwdriver, or, as shown in the engraving, may receive a hollow burr for cutting away the wood when the nail-head it is desirable to reach is imbedded in its substance. Face and sectional views of this burr are seen at F and G, the screw in the latter showing the mode of attaching the burr or screwdriver to the handle. A hole through the head of the implement is sufficiently large to allow the passage of a nail up through, as seen in the engraving. It is suited to nails of all sizes. The operation and use of the implement is plainly shown in the engraving. It will be seen that the upper lever of the tongs is a bell crank, the short arm being one of the jaws, which, when open, projects below the fixed jaw, and may be easily driven into the wood on one side of a deeply imbedded nail, when the construction of the handles will bring the fixed jaw down to the level of the point of the movable jaw, and thus secure a gripe which will securely hold and easily draw the hardest nail.

Patented through the Scientific American Patent Agency, March 3d, 1868, by T. C. Comstock, who may be addressed at Harrodsburg, Ky., for further information.

An Universal Genius.

Engineering publishes the following, which reminds us of a correspondent who closed a letter, describing a new invention, addressed to this office, not long since as follows: "I am an inventor, a farmer, repair watches, and practice medicine on week days, preach the holy gospel on Sundays":—

"Colin Pullinger, Selsey, near Chichester, contractor, inventor, fisherman, and mechanic, following the various trades and professions of a builder, carpenter, joiner, sawyer, undertaker, turner, cooper, painter, glazier, sign painter, wooden pump maker, paper hanger, bell hanger, boat building, clock cleaner, locks repaired and keys fitted, repairer of umbrellas and parasols, mender of china and glass, net knitter, wire worker, grocer, baker, farmer, stuffer and preserver of the skins of birds and insects, copying clerk, letter writer, accountant, surveyor, *engineer*, land measurer, house agent, vestry clerk, assistant overseer, clerk to the Selsey Sparrow Club, clerk to the Selsey police, assessor and collector of land tax and property and income tax, collector of church and highway rates; has served at sea, in the four quarters of the world, as seaman, sail maker, cook, steward, mate, and navigator. The maker and inventor of the following: an improved horse hoe, an improved scarifier, a newly invented couch grass rake, a machine to tar ropes, model of a vessel to cut asunder chains put across the mouth of harbors, a curious mouse trap, made on a scientific principle, where each mouse caught resets the trap to catch the next, requires no fresh baiting, and will catch them by dozens. Also, a mouse trap on a most novel, ingenious, and simple construction, being perpetually set, the bait will last for months; every mouse enters the trap through the same opening, and is most effectually secured, first on one side, the next on the other, and so in succession, catching any number; both traps being equally good, he leaves the public to decide which they consider best. A rat trap on a peculiar construction, that will catch and put them into the trap. An improved mole trap, model of a steamboat of quite a new and very improved construction, 4 ft. long, and challenged to beat any boat of the same length in the world. Crabs, lobsters, and prawns sent to any part of the world. Mouse and rat traps let on hire at one penny per week. If you doubt me, try me."

What is Power?

The word time means duration, nothing more and nothing less. The word distance means length, extension, nothing more nor less. But the word speed or velocity signifies both distance and time, that is, it involves both, for we cannot define nor conceive of speed without a given distance in a given time. Now the word power involves them all with the addition of pressure, that is, distance, time, and pressure, for we cannot define nor conceive of power without a given pressure, distance and time, or pressure and speed. Nor is it a compound word in its etymology, like *bene* or *male* or *vale*, but though a single term it has a compound and comprehensive and rather complex signification. Pressure, one of its constituents, is not simply weight pulling toward the earth by gravity, but also force pressing from the earth as by my hands holding up the book against gravity, and pushing along a wheelbarrow horizontally; in a word pressing any way in any direction. Power then consists of pressure and speed, *id. est.*, a certain force pressing a certain distance in a certain time, in the computation or estimate of which each one of these elements is equally essential. Then to ascertain the power of any engine we have only to multiply the pressure, which we express by pounds, into the speed, which we express by feet and minutes, and divide by whatever standard we adopt or wish, to bring it to a practical expression.

S. S. Rembert.

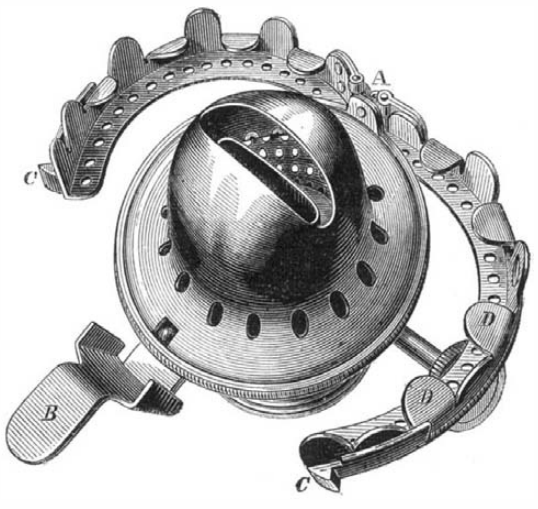
Composition for Sharpening Edge Tools.

This composition is intended for use in sharpening edge tools, being formed into the usual shape of whetstone or grindstone, and used in the same manner. It is formed by taking potter's clay and mixing thoroughly therewith about one half the quantity thereof of finely ground flint, using therefor the refuse material rejected in the manufacture of sand paper, as being too fine for that use. The mixture is wet, and then molded into any desired form, and then baked. The peculiar consistency of the potters' clay is such that it will not glaze in use, and the particles of fine flint will sharpen the tool applied thereto. Patented by George L. Witsil, of Philadelphia, Pa.

ROUP'S IMPROVEMENT IN LAMP TOPS.

Those kerosene lamp tops on which the glass chimney is held by means of a screw frequently break from the expansion of the glass by the heat of the flame if the screw is set up against the glass, and if the screw is not closely set up the chimney rattles if the lamp is moved, or perhaps falls off. Those also which hold the chimney by a spring frequently get out of order by the relaxation of the tension of the spring. To overcome these annoyances is the object of this improvement.

The top is of the usual form, but the rim that holds the flange of the chimney is in two parts, hinged as seen in the



engraving at A, and held when closed by the spring, B, and catches, C. When open, as in the illustration, the chimney is placed on the lamp top and the two semi-circles brought together and fastened by the spring. The bent snugs, D, overlap the flange of the chimney and when the glass becomes heated they yield sufficiently to its expansion to prevent it from breaking. Preliminary steps for securing a patent have been taken through the Scientific American Patent Agency by the inventor, T. T. Roup, of Greencastle, Ky.

It is better to correct a defective journal than to waste the oi which will lubricate half a dozen bearings which are in line

© 1868 SCIENTIFIC AMERICAN, INC.

Scientific American.

MUNN & COMPANY, Editors and Proprietors.

PUBLISHED WEEKLY AT
NO. 37 PARK ROW (PARK BUILDING), NEW YORK.

O. D. MUNN, S. H. WALES, A. E. BEACH.

☞ "The American News Company," Agents, 121 Nassau street, New York

☞ "The New York News Company," 8 Spruce street

☞ Messrs. Trubner & Co., 60 Paternoster Row London, are also Agents for the SCIENTIFIC AMERICAN.

☞ Messrs. Sampson Low, Son & Co., Booksellers, 47 Ludgate Hill, London, England, are the Agents to receive European subscriptions or advertisements for the SCIENTIFIC AMERICAN. Orders sent to them will be promptly attended to.

VOL. XVIII., No. 17....[NEW SERIES].. *Twenty-third Year.*

NEW YORK, SATURDAY, APRIL 25, 1868.

Contents:

(Illustrated articles are marked with an asterisk.)

*Improvement in Knitting Machines	257	Recent American and Foreign Patents	262
New Facts in Acoustics	257	Answers to Correspondents	263
Lofoden Norwegian Cod Liver Oil	257	Extension Notices	263
Sweets and their Manufacture	258	*Device for Harvesting Clover Seed	264
Across Mt. Cenis—Fell's Mountain Railway	259	*Improved Combination Hammer, Nail Drawer, Forceps, etc	264
Correspondence of the Sun with the Clocks	259	A Universal Genius	264
Steam Temperature and Expansion	259	What is Power	264
House Fly Parasite	259	Composition for Sharpening Edge Tools	264
Potassium and Sodium in Manures	259	*Roup's Improvement in Lamp Tops	264
Self-adjusting Telegraph Magnets	259	Screw Threads and Bolts—A Uniform System	265
Rattlesnake Poison—Its Antidote.	260	The Hanging and Care of Shafting	265
Vaccine Virus—Innoculation for Small Pox	260	Aluminum Bronze	265
*Royal Institution	260	The Wheel Question	265, 266
Marine Paint	261	Obituary—George Bartlett, Esq.	265
*Clarke's Patent File for Papers, Music, etc	261	Patent Claims ....266, 267, 268, 269.	270
Consumption and its Cure	261	Pending Applications for Reissues	270
Effects of Light on Vitality	262	Inventions Patented in England by Americans	270
Manufacturing, Mining, and Railroad Items	262		

SCREW THREADS AND BOLTS---A UNIFORM SYSTEM.

We have received a circular signed by Chief Engineer Theodore Zeller, U. S. N., President of a board of United States Engineers appointed by the Secretary of the Navy to examine and report upon the "various systems of screw threads in use by the principal manufacturing establishments in the United States, with a view of recommending a uniform system for general adoption." The circular asks for counsel and views upon the subject. The commission is to meet at the Philadelphia Navy Yard. Time not specified. We have repeatedly in these columns urged the advantages of a uniform standard for the dimensions of bolts and the grades of threads and recommended that of Mr. Edward Lyman of New Haven, Conn., whose system was endorsed by the Franklin Institute of Philadelphia and, we believe, has been adopted by several manufacturing firms. While we recommended the Lyman plan as the best we knew and far better than the no system at present in vogue, yet we believe it may be susceptible of improvement in some respects. In his plan the diameter of bolt head and nut is precisely the same, which seems to be an unnecessary waste of material. The head is, with the cross section of the shank or bolt proper, a solid, while the nut is pierced through its center by a hole equal to the diameter of the bolt. It is evident that the same amount of stock, considered in the cross diameter, is not necessary in the head as in the nut. To be sure Lyman makes his nut thicker than the head; this is correct, but we cannot see any reason for preserving the diameter of the nut for the head except, perhaps, keeping a uniformity, which if intended for the eye alone, is frequently useless, as from the relative position of head and nut one of them is effectually hidden in many clasess of work.

Lyman's form of thread is a V-thread of sixty degrees—the the angle of strength—the top and bottom of the thread being flat, and this part being in the proportion of one-eighth of the pitch. Thus there is no sharp angular nick in the substance of the bolt, which is always an invitation to fracture. Such a thread has no more tendency to "ride" or "strip" than any other, and is superior in the former respect to the round thread, affected by some mechanics. The Lyman thread will also save much annoyance caused by the breaking of the point of the screw cutting tool as in cutting the ordinary V-thread; there is also less danger of battering such a thread. On the whole, probably the commission cannot do better than to adopt this form of thread, whether they follow Lyman's grades or not. If a standard can be generally adopted it will prove of vast advantage to mechanics all over the country.

We have now in use in this country the Woodworth system and Holzapffel's, neither of which we believe has attained much popularity. Besides these, those concerns which do not adopt any particular standard become a "law unto themselves" and make and use their own plans. Possibly some of them contain valuable points which would aid in the establishment of a uniform system. We believe that in the addition to the foreign standards we have mentioned, one firm, celebrated for its accuracy in gages, etc, has attempted to inaugurate a system of screw threads and bolt sizes in this country. Of its merits we are unable to speak understandingly, not having a coppy of their diagrams before us. No doubt the commission to meet in Philadelphia will have plans enough submitted to them to confuse, if not to enlighten. We need, however, a national system of measures for screws, as we can hardly hope for one which shall meet equally the approbation of the mechanics and engineers of this and other countries.

THE HANGING AND CARE OF SHAFTING.

We believe there is less care bestowed and less sound judgment exercised upon the hanging and after care of shafting than upon any other means used in applying power to manufacturing processes. If the water wheel or the steam engine is in good order, performing its work properly, and the machines driven by it are also in good order, not a thought is bestowed upon the media between the actuating power and its ultimate development, except the necessary attention to the belts and the oiling of the shaft journals. Yet it is frequently the case, when the result is not satisfactory, that neither the driving power nor the machine which furnishes the product is at fault, but, if the result is not adequate to the cause, the reason may be found in the shafting or other intermediate transferrers of the power. Generally, in such a case, the belts are examined and their condition assumed as a reason for the imperfect transmission of the power from the prime mover. The condition of belts is a very important point in all manufacturing processes where power is used, and attention to them will save many dollars in the course of a year; but there are other as important elements, which are not always taken into consideration. One, and the principle one, is the condition of the shafting. A line of shafting running perfectly true, without jumping or jerking, turning smoothly and noiselessly, is a delight to the mechanical eye. The first thing examined by a thorough mechanic when he comes into a manufactory is the shafting. If the line runs true and the pulleys do not "wabble," the boxes do not exude oil at their ends, and there is no rattling or grinding, he says at once, "whoever hung this shafting knew his business."

A building for the reception of machinery should be erected with a view to its intended use. The walls and their foundations should be strong and rigid, and the timber sound and well seasoned. Fragile frames of imperfect lumber standing on insufficient foundations are costly receptacles for machinery. Shrinking and springing timber and settling walls cannot give the necessary support to the machinery, nor allow the reduction of friction to its minimum. In such rattle-traps a line of shafting will not retain its place twenty-four hours consecutively; a large proportion of the power employed is lost in overcoming unnecessary friction, and the running machinery rapidly deteriorates. When the amount of loss of power by friction exceeds twelve per cent there must be a "screw loose" somewhere.

But the reason of unsatisfactory running of shafting is not always its location in an improperly constructed building; sometimes those who hung it did not know, or, at all events, did not do their business. It is one of the most delicate jobs of the millwright and requires not only experience and skill, but discretion and good judgment. Where the shafting is supported by bracket boxes on posts a chalk line should be stretched and marked on the posts to represent the top and bottom of the brackets or the center line of the shaft. The sag of the cord, if the line is long, should be rectified by the eye aided by a water level or similar adjusting instrument. A wooden straight-edge of well-seasoned board, long enough to reach from one box to the next, and of uniform width is useful for leveling up the boxes. It is to be used on edge, one edge resting in the boxes and the spirit level placed on the other. Some millwrights provide themselves with iron cylindrical pieces of different diameters to fit various sizes of boxes, turned true and having a small hole drilled accurately through the center. These pieces are about six inches long and being laid in the box the cord is passed through the hole and stretched over three or four lengths of shafting. In practice however, we have preferred the straight-edge, which is rigid and offers a support to the spirit level. After all, the mechanical eye is the best test of line, although not of level.

When hangers are used the chalk line should mark the center of each hanger or a line directly over the center of the shaft. The flooring beams to which the hangers are to be secured, if of unequal depth or thickness, as is frequently the case, should be dressed to a level. Where shims are necessary they should be of rigid wood, well seasoned. We never found anything equal to rived cedar (not pine) shingles, which are almost as hard as horn. The bolt heads for suspending the hangers ought to be of flattened convex form, upset from the bar, and perfectly sound. A goodly sized washer should be inserted under the head and recessed into the floor. Where it is necessary to place a hanger directly to the floor planks, there should be a piece of seasoned plank, at least twice as long as the spread of the hanger legs, firmly bolted to the floor, on the under side of course. Some prefer lag screws or coach screws to bolts for securing hangers, and to say the truth, their hold is exceedingly tenacious; we never knew one to draw. The hole for their reception, however, should not exceed in diameter the size of the screw, less the thread.

One common fault in hanging shafting is spreading the hangers or brackets too far apart. A length of shafting should not be so insufficiently supported as to sag in the slightest degree; if it does it will spring when in motion and create a large amount of friction in the boxes. The hangers should also be located with reference to the weight supported on the shaft; a heavy pulley, or one, the belt of which sustains a great strain, should be supported by a box or boxes in close proximity. To accomplish this it is of course necessary that the position of every machine should have been determined before the shafting was hung; a competent millwright can do this; one that cannot make a plan and carry out its details is incompetent.

The shafting properly hung and the machinery in operation, the line should be inspected once in every two or three weeks, the hangers or brackets adjusted, if out of line, and every defect remedied. This is necessary with the best hung shafting and in the best building, if the economy of power is worth looking after; for there are so many disturbing causes affecting the integrity of a line that it is impossible to depend upon long continued accuracy unless constant attention is given to the condition of the shafting. A box slightly out of line or level will absorb a large amount of oil yet be continually hot, waste power by unnecessary friction, and grind and cut the shaft. Attention to these matters will be found to pay at the end of the year.

ALUMINUM BRONZE.

In treating of this new metal, one of the alloys of aluminum, we find ourselves indebted to the valuable writings and experiments of scientific men of Europe. We say Europe because this metal, comparatively unknown in this country, has not received much attention from our learned men. Its invention is a disputed subject between France and England, the former claiming the honor for St. Claire Deville and Debray, and the latter country naming Dr. Percy as the inventor. At that time many eminent men of both countries had their attention turned toward aluminum and its alloys so that it is highly probable that both can claim equal shares of the honors. The only alloy of this metal which shall receive our attention is that of ten per cent of aluminum with ninety per cent of copper. There are many others excellent for the purposes to which they are applied, but which do not possess the qualities requisite for mechanical purposes of that above named. Strength, elasticity, resistance to friction and oxidation, are among its peculiar attributes. Its strength approaches the average strength of cast steel, a statement which would sound improbable if not corroborated by experiments made by Mr. Anderson, Royal Gun Factory, Messrs. Simms, London, and Mr. Morin, Nanterre, where it was found that the tensile strength of this metal is of 5,328 kilogrammes to the square centimeter. At the same time a very important point was determined; the transverse strength or resistance to being bent. This was found to be for brass, 2·22, gun metal, 0·15, aluminum bronze, 0.05. That is to say, three equal bars of these different metals were fastened at one end so as to be perfectly horizontal, a certain equal weight was placed at the free end of each bar, and the result measured by an instrument for that purpose. Brass bent at 2·22 degrees of the instrument, the other metals as indicated above, thus showing the resistance of aluminum bronze to be 44 times greater than brass. The transverse strength, the resistance to permanent flexion, resistance to friction and the superior resistance to oxidation displayed by this metal, although the latter quality has not yet been accurately determined, admirably qualify it for delicate mechanism and also for purposes where hardened steel was entirely employed. The tenacity of this alloy is astonishing and is hardly equalled by any other metal; it is more difficult to cut than gold or brass but the cut is very clean and smooth. Further experiments, resulting very satisfactorily, were made to determine the resistance to compression or hardness of this metal by Messrs. Huguenin and Grossmann. These gentlemen have dwelt at length upon this subject, and have made careful tables, too long to insert here, showing the strength and elasticity of aluminum bronze compared with other metals; let it suffice to say that this new alloy possesses many of the qualities of cast steel and gold. When it becomes generally known, it is certain that it will inaugurate a new era in the manufacture of fancy metal work, replacing all gilt and gold plated articles, and thus open a new field to American industry.

THE WHEEL QUESTION.

This remarkable discussion continues to progress with unabated interest, and the letters still pour in upon us from all directions. We are seriously charged with having unfairly or prematurely dropped the subject from our columns, and are earnestly requested to reopen it. We have concluded to do so, in a manner that we trust will give general satisfaction, but without burdening the pages of the SCIENTIFIC AMERICAN. We propose to issue a special publication for the particular benefit of all the wheel philosophers, and we call their attention to the proposed terms and conditions, as set forth in another column. Let "The Wheel" be kept in motion.

OBITUARY.---GEORGE BARTLETT, ESQ.

Mr. Bartlett left this city on the evening of the 8th, to visit a sister residing in Providence, R. I. On the afternoon of the 9th, he laid down to recover himself from the fatigue of his journey, and shortly after he was discovered to be dead. Thus suddenly passed away a steadfast friend, a ripe scholar, and a zealous promoter of science and the arts.

Mr. Bartlett was for several years an editor on this paper, and in this capacity he won the high regard of all those who were associated with him. His contributions to the paper were remarkable for their clearness of expression and aptness of illustration; they were always entertaining as well as instructive. Many of his sprightly paragraphs have circulated through the newspapers all over the world. He had the ability from education and natural endowments of making his name illustrious in literature and science, and he lacked only the personal ambition. He printed very little over his own name, and thus his whole worth was known only to his intimate friends.

In his dealings with men he was always respected. He seemed wholly incapable of deceit. We believe he was truly an honest man

© 1868 SCIENTIFIC AMERICAN, INC.

THE WHEEL QUESTION.

"How many revolutions on its own axis will a movable wheel make in rolling once around a fixed wheel of the same diameter? Answer, *One.*"

This discussion, instead of subsiding, has, like Vesuvius, now broken out afresh, and is having an excited run in various parts of the country.

We were lately advised that the learned Professor of Engineering in one of our largest northern colleges, had pronounced in favor of two revolutions. The same mail brought us an excellent essay from the learned Professor of Engineering in a prominent southern establishment, clearly showing that there could be but one revolution.

We are still in receipt by every mail of numbers of interesting letters, many of which are written with care, presenting new views and illustrations. Every one of them ought to be published, together with the stock of some seven hundred other letters upon the subject, that we already have on hand. But it is impossible, for want of space, to print them in the SCIENTIFIC AMERICAN, and, in order to meet the exigency, we have concluded to issue a special publication. We therefore hereby give notice to the wheel-philosophers, of whatever shade or grade, and to all lovers of scientific discussions, that on the 15th day of May, 1868, we shall commence the publication of "THE WHEEL," a Magazine of Science and the Useful Arts."

1. The work will be issued in monthly parts, handsomely printed with large types, large octavo pages, uniform with the Patent Reports, at 25 cents each number.

2. All persons who desire to take part in the wheel-discussion are invited to send in their communications, which will be published in the order of their reception, on the rule of "first come, first served." Those who have already sent letters will notify us if they desire to have them appear.

3. In order to meet the expenses of the "Wheel Question," each contributor will be expected to pay for the type setting and printing of his letter, which will be at the rate of $2.50 per printed page. There will be 56 lines on each page, and an average of 12 words to a line. The expense for diagrams will be extra, and will probably cost, if simple, from $1 to $3. The majority of the letters will not exceed half a printed page. Each contributor will thus be enabled to reckon the cost for himself, and the amount he will please remit to us at the time of sending his communication.

"THE WHEEL" will be continued in monthly parts so long as both ends of the financial department continue to meet.

Each contributor will be allowed to select his own range in the discussion, and may branch off to other subjects if he chooses; but the Editor reserves the right to reject improper communications. All will concede that it is not necessary for scientific writers to call each other knaves and pickpockets, or otherwise impugn the motives of those with whom they do not agree. Let the discussion be full, fair and frank. Conducted in this spirit, the work when completed will be one of great interest and value. The monthly parts will be stitched in handsome paper covers, and the pages of the body of the work will be consecutively numbered, so that they can be conveniently bound for reference and preservation.

Although "THE WHEEL" will be devoted to the solution of the "great question" which heads this article, it will also contain space for the discussion of other scientific questions, the only requisite being that the several writers shall supply the cost of setting their types.

Each contributor will be entitled gratis to one copy of "THE WHEEL" in which his communication appears.

Address all letters to Munn & Co, 37 Park Row.

EDITORS SCIENTIFIC AMERICAN:—Your question of a movable wheel rolling round a fixed wheel *as* you state it and decide it, is not to be disputed; but when we come to consider axles, centers, and revolutions, and connect these terms with forces and motions, we shall surely find questionable points in your solutions, whether with the printing roller, corduroy and wheelbarrow, or rolling a plain wheel round another plain wheel of same diameter. As a plain hand rolling question the movable wheel makes one revolution on its own axis while rolling once round a fixed wheel of the same diameter. The "ones" have it. Admitted. As a purely geometrical question, applied, or unapplied, to geared machinery, the movable wheel will make two revolutions, or break, and I will wager a printing roller and corduroy wheelbarrow on the result. But to the text. Why is it that two wheels of equal diameter, and each revolving on its axis, rolling reciprocally round each other, will each make one revolution on its, or their, axis, or axes, in so doing? Surely, here comes a point in question. It is a question that has much in it—not for controversy, but for mechanical elucidation and learning, and for the investigation and proper conception of astronomical and planetary motions.

In the "*ones*" view of the case the force is applied to the periphery; in the "*twos*," the force is applied at the axis. That is the difference, and the only difference, existing between the contestants. You said there was really nothing in the question. There is not, really, in the naked way you put it; but as a mechanical contrivance in geared, rotary, and reciprocating machinery, there is much in it, and I doubt whether you have ever before presented a question that has developed more useful thought than this very simple one. We are in the very same fix as regards the motion of the moon on *its* axis. Reasoning from analogy we suppose it to revolve on its axis once in twenty-eight days, and yet all its phenomena as presented to us can occur without such motion.

Lancaster, Pa. JOHN WISE.

Mr. William Hill, of Springfield, Mass., sends an excellent communication explanatory of the question, with diagrams showing some very interesting forms produced by the several motions. We hope he will have them published in the forthcoming "WHEEL." His letter concludes as follows:—"Permit me to commend the study of this problem of the rolling wheel especially to young mechanics, as there is hardly an element of motion in the whole range of mechanical science, which is not involved directly or indirectly in its solution and the issues naturally growing out of it."

Mr. Jno. B. Wilson, of Chicago, Ill., sends an interestsng communication showing that the philosophers are all wrong, that the cat's eyes will not revolve, whether you swing her by the tail or neck, and finally, that the correct answer to the original question is, *None.* The whole letter ought to appear in THE WHEEL.

The following is only an extract from a letter on the question. We hope our correspondent will have the whole published in THE WHEEL, for it is "a stunner:"

"Allow me to express the opinion that you have unfairly dropped the question without any practical or clear theoretical demonstration in defense of your views; while the defense offered by your correspondents has been very lame indeed. I venture the assertion that in one year from now, when your mind is free from the many points suggested by your correspondents, you will agree with me in this last. If you have read all the letters you have received on this subject we cannot wonder that your brains are muddled, and you fear 'diagrams, theorems, postulates and astronomical observations.'

Peekskill, N. Y., April 4, 1868. H. ANDERSON."

MESSRS. EDITORS:—I see that "L. M. complains very earnestly that you did him injustice in publishing his last communication." Being one of L. M.'s supporters so far, I feel a little interested in relation to the above remark. If L. M. really thinks you have not given him justice all through the discussion, I, as an individual, think otherwise; and I say that I do not believe any discussion could be carried on with more justice, patience and gentlemanly courtesy and good humor, than you (as editors) have shown and exercised toward L. M. and his several supporters (I among the rest). L. M.'s diagrams have been in full, fairly represented, and in some cases duplicated, and I do not see wherein he has any just cause for complaint. I know nothing about L. M. personally, or outside the "SCIENTIFIC," but I supported his theory so far as I considered it to be correct; but the moment that L. M. is dissatisfied with the treatment of the editors toward him in the wheel question, I want the editors to know that I am of quite the reverse opinion. Their patience is astonishing!

Gloucester, N. J. JOHN HEPBURN, SEN.

A NEW GRAFTING WAX.—This being the season for grafting, the following highly recommended recipe for preparing the wax is worthy of trial: One pound of resin, five ounces of 95 per cent alcohol, one ounce of beef tallow, one tablespoonful of spirits of turpentine. Melt the resin over a slow fire, add the beef tallow, and stir with a perfectly dry stick or piece of wire. When somewhat cooled, add the turpentine, and last the alcohol in small quantities, stirring the mass constantly. Should the alcohol cause it to lump, warm again until it melts. Keep in a bottle. Lay it on in a very thin coat with a brush. In a room of moderate temperature, the wax should be of the consistence of molasses. Should it prove thicker, thin it down with alcohol. It is always ready for use, is never affected by heat or cold, and heals up wounds hermetically.

A REPLANTED TOOTH.—A dentist of Zanesville, Ohio, reports to the *Dental Register*, that eleven years ago, a lady applied to him for relief from an aching tooth. In extracting the offending member he permitted the patient to place the instrument on what she believed to be the aching molar, but which proved to be a perfectly sound tooth. The lady was so much annoyed at the loss of the perfect tooth, that the operator replaced it, after it had been out of the mouth about ten minutes, when it became firmly fixed in place, and satisfactorily performed its full masticating duties, until a few months ago, when the lady again sought his professional services, and he found the same replanted tooth aching from an exposed nerve.

OFFICIAL REPORT OF PATENTS AND CLAIMS

Issued by the United States Patent Office,

FOR THE WEEK ENDING APRIL 7, 1868.

Reported Officially for the Scientific American.

PATENTS ARE GRANTED FOR SEVENTEEN YEARS, the following being a schedule of fees:—

On filing each Caveat	$10
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Reissue	$30
On application for Extension of Patent	$50
On granting the Extension	$50
On filing a Disclaimer	$10
On filing application for Design (three and a half years)	$10
On filing application for Design (seven years)	$15
On filing application for Design (fourteen years)	$30

In addition to which there are some small revenue-stamp taxes. Residents of Canada and Nova Scotia pay $500 on application.

☞ *Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to Inventors, may be had gratis by addressing MUNN & CO., Publishers of the Scientific American, New York.*

76,294.—STEAM ENGINE VALVE.—Thomas A. Bisbee (assignor to himself and Edwin R. Stillwell), Dayton, Ohio.

I claim, 1st, The arrangement of two balance chambers with packing rings one being combined with each end of the valve, whereby to obviate the tendency to a rocking motion, caused by one large ring or one series of rings.

2d, The described arrangement of the joint plug, I, packing ring, G, and valve, A, for the purposes described.

3d, The combination in a valve box cover, of the steam passages and strengthening ribs, as described.

4th, The combination of the ring, G, joint plug, I, valve box cover, D, and steam passages, E E E E, substantially as described.

76,295.—PISTON PACKING.—Thomas A. Bisbee (assignor to himself and Edwin R. Stillwell), Dayton, Ohio.

I claim, 1st, The cylindrical plug, E, substantially as and for the purposes described.

2d, The combination of the plug, E, and eccentric ring, A, substantially as described.

76,296.—SPRING BED BOTTOM.—Lewis R. Bradbury, Charlestown, Mass,

I claim the combination of the spring, C, made substantially as shown, with the spring, H, placed under it, the two springs operating together for the purposes substantially as set forth.

76,297.—SAFETY POCKET ATTACHMENT.—John Brosius, Rauch's Gap, Pa.

I claim the safety attachment composed of the jaws, A and B, pins, D, springs, E, levers, F and G, and chain, H, for the purpose and substantially as herein specified.

76,298.—BATH TUB.—A. C. Brownell, Brooklyn, N. Y.

I claim as a new article of manufacture the bath tub constructed as described, consisting of the tongued and grooved bottom and end slats, c c', the curved sides, d, outer frame, b, and curved supporting brackets, B B, all arranged as described for the purpose specified.

76,299.—SPINNING MACHINE.—J. E. Burdge, Cincinnati, O.

I claim the combination and arrangement of the fluted roller, P, cylinder B, and carding cylinders, E2 E3 E1, as and for the purpose set forth.

In combination with the above, the spindles, G, as and for the purpose set forth.

76,300.—COMBINATION LOCK FOR DOOR.—Wm. C. Bussey, San Francisco, Cal.

I claim the bars, D D, and the lugs, a a, for retaining the bolt, together with the plate, F, bar, d, and spring, G, in combination with the grooved annular tumblers, the whole constructed and operating substantially as and for the purpose described.

76,301.—MACHINE FOR GRINDING AND CUTTING DOWN AUGERS.—E. O. Carrington and Edward Carrington, West Meriden, Conn.

We claim the arrangement of the swinging bar, E, carrying one mandrel, B, and other mandrel, d, the said mandrel, d, provided with a self adjusting head, f, and combined with the grinding cylinder, C, the whole operating in the manner substantially as set forth.

76,302.—STOVE GRATE.—Gardner Chilson, Boston, Mass.

I claim the furcated arm, D, for supporting the grate, arranged so as to allow both the tilting and lateral vibration thereof, substantially as herein specified.

Also the grate shaft head and handle, made substantially as represented and as hereinbefore described.

76,303.—ENVELOPE.—Richard S. Clark, Great Bend, Pa.

I claim the flap, A, so placed upon the envelope as to fold over on to the face of the envelope, substantially as and for the purpose described.

76,304.—BUTTER WORKER.—J. L. Colburn, West Burke, Vt.

I claim the wheel, C, constructed as described, operated by the crank, D, in combination with the box, B, when the same are constructed as described in the aforesaid combination.

76,305.—CLOTHES DRYER.—Henry P. Crouse, Hartland, Mich.

I claim the combination of the posts, A and B, the pins, C and D, the wedge E, stop, F, the collars, G and K, the arms, H and I, the lines, J, and pin, L, when constructed, arranged, and operating substantially as and for the purposes designed and herein described.

76,306.—SEED SOWER AND CULTIVATOR.—Charles G. Curtis, Plano, Ill.

I claim, 1st, The cylinder, B, arranged with spiral grooves, a, for distributing seed, substantially as and for the purpose set forth.

2d, The tooth, c, having a curved edge, e, convex back, g, and concaved sides, c c, substantially as described.

3d, The combination of the levers, C E, with the two part roller, P, arranged substantially as set forth.

76,307.—HORSE RAKE.—George Deal, Wilmot, Ohio.

I claim the angle irons, G G, and the standards, H H, and bearing arms, I I, to which the bar, S, is hinged, mounted on said angle irons, constructed and arranged and applied to the rake substantially as and for the purposes herein specified.

Also, the combination and arrangement of the hinged bar, S, rake teeth, L L, and roller, D, so that the said roller balances, or nearly balances, the rake teeth, substantially as specified.

76,308.—MEDICINE.—Benj. W. Donaldson, Dixfield, Me.

I claim the above described compound of medicine, prepared substantially in the manner set forth.

76,309.—SPRITSAIL BOOM SLING.—George Dowling, Fair Haven, Conn.

I claim the sling, D, constructed so as to receive the boom, C, and provided with ears, f, and combined with the swivel, d, on the mast's strap, A, and the whole constructed so as to be adjustable and operate substantially in the manner herein set forth.

76,310.—CULINARY VESSEL.—Horace L. Dunklee, Boston, Mass.

I claim in a culinary apparatus made in sections, as described, the combination in each section of the steaming vessel with its surrounding case, under the arrangement specified, so that the said vessel shall be hung suspended within its case by means of flanges or bearings, a b c, formed upon both the vessel and case, in the manner set forth.

76,311.—SELF CANCELING RAILWAY TICKET.—John Dyer, Chicago, Ill.

I claim a self canceling ticket, composed of any number of checks, firmly fastened in a flexible cover, containing a part of the contract, and which checks are graduated in length and consecutively numbered or otherwise designated and arranged, and which when detached from the cover effectually cancel all obligation represented by them when fastened to the cover, for the purpose and substantially as herein set forth.

76,312.—NECKTIE SUPPORTER.—George R. Eager, East Boston, Mass. Antedated March 21, 1868.

I claim, 1st, The necktie supporter, consisting of the parts, b c, d b', c' d', to engage with, and the saddle or bend, a a', to rest upon the button, and the attaching part, y, all formed and operating as herein described and represented, for the purposes set forth.

2d, The combination, with the above, of the elastic band, G, applied in the manner and for the purposes set forth.

76,313.—WASHING MACHINE.—Nathaniel T. Edson, New Orleans, La. Antedated March 28, 1868.

I claim, 1st, The combination of the apron, fig. 4, with the elastic straps, c the clamp, e, and screw, d, as specified.

2d, The lock, g, in combination with the apron, as specified.

3d, The combination of the rubber or basket with the double crank, g a and collar, h, as and for the purpose specified.

76,314.—BROILING APPARATUS.—Mary E. A. W. Evard, Leesburg, Va.

I claim the combination of the pivoted frame, G G1 G2, hinged and notched plate, M, for supporting the revolving broiler or spit at any desired distance from the fire, substantially as described.

2d, The combined arrangement, in connection with the foregoing, of the oven, B, of the flap, C, and doors, D D' and E, substantially as and for the purposes set forth.

76,315.—COOKING STOVE.—Mary E. A. W. Evard, Leesburg, Va.

I claim, 1st, The plate, A1, employed in conjunction with the grate bars, a, to form the bottom of the fire box, substantially as and for the purpose set forth.

2d, The movable shelf, O', adapted to be supported upon the front doors, O, substantially as and for the purpose set forth.

3d, The removable supplemental heater, P, provided with a damper, P2, and employed in the manner and for the purpose set forth.

4th, The foraminated air distributers, N, when provided with registers, n n', and constructed and arranged substantially as and for the purpose described.

5th, The grooved ridges, c and f, cast on the top and bottom plates of the oven, serving to impart strength and rigidity to said plates, without obstructing the flues, and also to guide and support removable partitions, F F1, for dividing the oven into a plurality of compartments, substantially as described, in combination with the opening, L, in the rear of the oven.

76,316.—TOASTER.—Mary E. A. W. Evard, Leesburg, Pa.

I claim, 1st, The rack, C, adapted to be turned upon the standard, B, substantially as and for the purpose described.

2d, The nut, D, formed with threaded perforations, d d', at right angles, to adapt the rack to be supported either vertically or horizontally, substantially as set forth.

76,317.—SUSPENSION SPRING FOR LAMPS.—John A. Evarts (assignor to Bradley and Hubbard), West Meriden, Conn.

I claim, 1st, The combination of the coil spring, F, with the band, G, and lower friction roll, D, substantially as specified.

2d, The combination of the coil spring, F, with the band, G, and ratchet, whether the ratchet be applied directly to the cylinder, A, or to the friction roll, substantially as described.

3d, The combination of the coil spring, F, the band, G, and the upper lower friction rolls, H and D, substantially as described.

4th, The combination of the coil spring, F, the band, G, the two rolls, H and D, with the ratchet and pawl, constructed and arranged substantially as set forth.

76,318.—PUMP.—Alford Fisher, Nashua, N. H.

I claim the described arrangement and combination of the rod, A, independent bail, B, the flange cap, O, fastening rods, M M', and neck piece, D.

76,319.—LAMP EXTINGUISHER.—Joseph W. Fowle, Boston, Mass., assignor to Wm. Carlton, Rufus S. Merrill and Chas. E. Abbott.

I claim a lamp extinguisher consisting of inclined slides, which, when brought into contact form a close chamber over the mouth of the wick tube, substantially in the manner described.

76,320.—FRUIT GATHERER.—C. W. Gage, Homer, N. Y.

I claim the polygonal hoop, B, when constructed in such manner as to fold separately from the cloth table, F, and center pieces, C, as shown in fig. 3, as and for the purpose set forth.

76,321.—GAS COOKING APPARATUS.—Michael Germann, Cincinnati, Ohio.

I claim as an article of manufacture the gas cooking apparatus as described, consisting of an iron bracket, pot stand and gas burner combined, substantially as and for the purposes set forth.

76,322.—STEAM ENGINE GOVERNOR.—Joseph W. Gray, Clermont County, Ohio, assignor to Saladee, Fee & Co.

I claim the combination of a steam gage and governor, so constructed and arranged that the pressure of the steam in the boiler shall govern the engine, substantially as shown and described.

76,323.—SEWING MACHINE FOR WORKING BUTTON HOLES.—M. C. Gritzner, Bruchsal, Grand Ducby of Baden.

I claim, 1st, The combination with the needle of a sewing machine, or ordinary or suitable construction, of a laterally reciprocating tongue plate, substantially as specified, and mechanism for imparting said movement to the tongue under the arrangement described, so that the said tongue will be placed close to and alternately to the right and left of the needle, during each two successive stitches the needle makes, and so impart a zigzag motion to the cloth to be sewed, substantially as shown and specified.

2d, The laterally reciprocating plate having two slots, one on each side of the tongue, through which the needle alternately stitches, the metal around said slots serving as firm support to the cloth, and preventing the latter from being dragged down when penetrated by the needle.

3d, The mechanism herein described for moving the material for button hole sewing, etc., combined with gearing and a cam, or its equivalent, substantially as specified, applied to a sewing machine in such manner that the said mechanism, when engaged with said gearing and cam, will move laterally in one direction with the needle, makes one stitch, and in the opposite direction during the next succeeding stitch, as shown and set forth.

4th, The combination of the laterally reciprocating tongue or plate with a feed piece adapted to engage with the ordinary feed dog of a sewing machine, and so arranged that the said feed piece, while moving laterally with the reciprocating tongue, shall have an independent forward and backward and up and down movement, for the purpose of effecting the feed of the cloth, as set forth.

© 1868 SCIENTIFIC AMERICAN, INC.

5th, The combination and arrangement of the plates, a b, and the plate, c, and its appurtenances, the whole constituting a device or mechanism for button hole sewing, etc., capable of being applied either temporarily or permanently to any suitable sewing machine, in the manner herein shown and described.

76,324.—SKATE.—M. C. Haight, Geneva, N. Y.

I claim combining the foot and heel-plates, B C, directly with the runner, A by means of the solid screws, a a', forming a part of the runner itself, and making the screws, b b, that attach the straps to the footplate sharp pointed, to serve as the brads for holding the foot, the whole arranged as described, and operating in the manner and for the purpose specified.

76,325.—CAR SEAT.—Stephen B. Holden (assignor to himself and Wm. A. Newton), Sedalia, Mo.

I claim, 1st, The combination of the rubber or equivalent springs, F, with the seat frame, D, and with the longitudinal bar, b2, of the stand, B, substantially as herein shown and described, and for the purpose set forth.

2d, The rubber block springs, H, in combination with the longitudinal bar, b2, of the stand, B, substantially as herein shown and described and for the purpose set forth.

76,326.—BASE BURNING STOVE.—Robert Holmes, Detroit, Mich.

I claim the combination and arrangement of the dampers, E I, and flues, D, O, L and P, to produce a downward or a direct draft, substantially as described.

76,327.—SIFTER.—S. S. Hughson, Newark, N. J.

I claim the construction of the cylindrical sifter with the sieve, C, in the center, the sliding lid, G, and handles, I K, on the top of the sifter, door, M, at the side, substantially as and for the purpose specified.

76,328.—FRICTION CLUTCH.—James B. Johnson and Wm. H. Birch, San Francisco, Cal.

We claim, 1st, The axle, A, with its fast pulley, B, and enclosing case, C, with its inclined planes, c' c', together with the rollers, a a a, the whole constructed and operating substantially as and for the purpose described.

2d, We claim the spring, d, attached to the projection, b, or its equivalent, when used in the clutch for insuring a prompt action of the rollers, aa, substantially as described.

76,329.—HEATING APPARATUS.—John Johnson, Saco, Me.

I claim the method of obtaining and transmitting heat by the use of a small and definite quantity of water or other liquid contained in an air-tight vessel, substantially as herein described.

76,330.—DEVICE FOR HOLDING CANS WHILE BEING SOLDERED.—Thomas Kerr and John C. Kelley, Edinburg, Ind.

We claim the sleeve, E, screw shaft, D, springs, I I, nuts, F H, staves, K, arm, M, plate, N, and lever, L, all constructed and arranged substantially as and for the purposes herein set forth.

76,331.—APPARATUS FOR SEPARATING ORES AND MINERALS.—Stephen G. Krom, New York city.

I claim, 1st, in machines for separating granular materials of different densities by the aid of intermittent jets of air or other fluid, the passage, F, to discharge the lower stratum, either from an inclined or level bed of a double or single machine, as herein described.

2d, In such machine, the small apron, G, at the lower discharge, as described.

3d, In such machine, the shoe, F', at the lower end of the lower discharge as described.

4th, In such machine, the escape valves, c c, for the purpose described.

5th, In such machine, the blowing means, or its equivalents, situated close to the material, in combination with the within-described manner of maintaining its proximity under various changes of stroke, for the purpose described.

6th, The bellows, C, having a series of flaps, C2, covering nearly the whole open-work or perforated surface, as shown in Figs. 1, 5 and 7.

7th, In such machine, the cam wheel, D, constructed and arranged relatively to the lever, D, and its connections, as and for the purpose described.

8th, In such machine, the closed box, H, constructed and arranged relatively to the inclosed and connected parts, substantially as and for the purpose herein described.

76,332.—OX YOKE.—Isaac W. Little, Newbury, Mass.

I claim the arrangement and combination of the sliders, b, and their clamping screws or devices, with each of the bows, B B, and with slots, a a, formed in the yoke, as set forth.

76,333.—GAS BURNER.—Richard B. Locke (assignor to the Self-Lighting Gas Burner Company), New York city.

I claim the screw, l, in combination with a supplementary burner, when the same is constructed and arranged substantially as described.

76,334.—NAME PLATE FOR STREET LAMP.—Thomas T. Markland, Jr., Philadelphia, Pa.

I claim the name plates, B, in combination with street lamps, constructed and arranged substantially as described.

76,335.—STREET LAMP.—T. T. Markland, Jr., Philadelphia,

I claim, 1st, The combination of name plates, C, with the frame of the lamp, separate from the main panes of glass or the body of the lamp, whether of square or other form, substantially in the manner above described and for the purpose set forth

2d, The combination of the name plates, G, with the neck, F, of the lamp, substantially as described and for the purpose specified.

3d, The combination of a glass neck with a street lamp, the said neck being constructed either with or without name plates, substantially as and for the purposes above described.

4th, The combination of the slot, l, of the tube, N, on the bottom plate, E, with a corresponding lug on the lamp post, substantially as described and for the purpose set forth.

5th, A sectional lamp, constructed substantially as described and for the purposes specified.

76,336.—CHILD'S BED.—Mary E. J. Marr, Jefferson, La.

I claim the bedstead proper, herein described, consisting of the horizontal pieces, A A' A" A,"' posts, B, and arched frame, C C' D, in combination with the frame, E, when the latter is constructed as herein described, and provided with a cloth bottom, G, and cloth sides and ends, F, and transverse cross band, H, and is hinged to the bedstead proper, substantially as and for the purpose set forth.

76,337.—BRICK MACHINE.—Ignace Martin, Newark, N. J.

I claim, 1st, The board or plate, G, in combination with the eccentric shafts, H H, hooks, m, and pins, n, all made and operating substantially as herein shown and described.

2d, The mold wheel, A, when provided with notches, s s, in combiantion with the spring catch, r, and cam, t, all made and operating substantially as and for the purpose herein shown and described.

3d, The trough, N, as a receptacle for oil, and a brush, M, arranged to revolve therein, and contignous with the plungers, to lubricate them, as specified, when arranged beneath and operating in combination with the revolving mold wheel, A, and secured to the base plate, C, substantially as described and shown.

4th, The combination, with the wheel, A, of the plate, G, and eccentrics, H, of the plungers, j, stems, k, and cam, p, all made and operating as set forth.

76,338.—PROCESS FOR MAKING GAS.—James McGeary, Salem, Mass.

I claim, 1st, The use of partially-spent coal, in one retort, to quicken and intensify the heat in another retort or chamber, alternately, as set forth.

2d, The use of partially-spent coal for decomposing superheated steam, substantially as set forth.

3d, The use of superheated steam, produced as described, as and for the purpose set forth.

76,339.—HARVESTER RAKE.—D. Mendenhall, Fairfield, Iowa.

I claim, 1st, A reciprocating rake, and a hinged platform section, combined in such manner that after the rake moves across said platform and delivers a gavel from the inner side thereof, it shall then return beneath said section to the outer end of the platform, substantially as described.

2d, A platform, having a location behind the cutting apparatus during the receiving and delivery operation, and a fender or guard, J, between the cutting apparatus and the rear of the platform, in combination with a reciprocating rake, which takes the grain which has been cut from the platform, and delivers it at one side of the platform out of the path of the team, such rake being guided by machinery, the whole substantially as herein set forth

3d, A rake or clearer, which is controlled in its movements by extension joints, L, and a pitman rod, N, and which is pivoted on top of the platform, in combination with a hinged grain guard, J, which will protect the clearer from falling grain during its return stroke, substantially as described.

4th, The combination of a reciprocating rake, a side-delivery platform, a hinged guard, J, and an outer guard, b, substantially as described.

76,340.—FEEDING MECHANISM FOR SEWING MACHINES.—John A. Minor, Middletown, Conn.

I claim the arrangement, on the independent adjustable plate, K, of the lever, S, and the feed dog, L, substantially as described and for the purpose specified.

76,341.—BRICK MACHINE.—James W. Osgood (assignor to himself and S. V. R. Carpenter), Columbus, Ohio.

I claim, 1st, A revolving feeding cam, B1, applied within a filling box, B, and interposed between a pug mill and a rotary mold drum, substantially as and for the purpose described.

2d, A reciprocating knife, C, arranged in combination with the filler, B1, and the movable mold wheel, substantially as and for the purposes described.

3d, A wiper or scraper, B2, in combination with a filler, B1, operating substantially as described.

4th, The guard or division plate, a1, in combination with a horizontal cylindric pug mill and filling box, arranged substantially in the manner and for the purpose described.

5th, Securing the central follower, D1, of each gang or series of mold cells a, rigidly to bar, D2, and having the other followers of the same gang attached loosely to said bar, for the purpose of preventing the followers from working hard or binding in their mold cells, substantially as described.

6th, Platen, F, hung by means of arms, F2, which are pivoted to the frame, A, and jointed, as at f3, to arms, F1, of the platen, so that the face of this platen shall fit squarely against the mold drum, D, notwithstanding that the platen swings on a pivot or pivots, substantially as described.

7th, Providing the platen, F, with clog rollers, f1, ratchet wheels, f2, and pawls, f3, substantially as described.

8th, Effecting the compression and condensation of the clay in the mold cells, by means of reciprocating hooked press rods, H, acting upon the extremities of the four lower bars, D2, in combination with a platen, F, said bars, H, and platen, F, being operated by means of cams upon a crank shaft, G, substantially as described.

9th, The arrangement of the expelling hooks, i, and the specified mechanism for operating these hooks, to wit, the cam, k, yoke, K, and bell crank, I1 I2, substantially as described.

10th, The combination and arrangement of devices specified, whereby the mold drum, D, the platen, F, the press bars, H, and the expelling hooks are operated from a single shaft, G, substantially as described.

11th, The combination and arrangement of the cam, Hx and f3, the crank shaft, G, lever, G3, press rods, H, mold drum, D, and platen, F, substantially as and for the purpose described.

12th, The adjustable cross head, g1, and adjusting pin, j, applied to the yoke of each one of the pressing rods, H, substantially as described.

13th, A yielding receiving platform, E, constructed and arranged beneath the mold drum, D, and supported in such a manner as to receive the bricks as they are expelled from said drum, and descend and yield under the weight of the bricks, substantially as described.

76,342.—AROMATIC LINING FOR CARPETS, CHESTS, DRAWERS, WARDROBES, ETC.—John M. Perkins, Plainfield, N.J.

I claim an aromatic lining, when constructed substantially as described, for carpets, wardrobes, chests, and the like, for the purpose of protecting said carpets, and the contents of said wardrobes, chests, and the like, from the ravages of motbs and other destructive insects.

76,343.—ROTARY CUTTER FOR PLOWS.—John C. Pfeil, Argenzville, Ill.

I claim, 1st, The peculiar arrangement and combination of the spindle, B, on cutter arm, A, and collar, M, with hole, B, therein, for the purpose of forming a caster joint for cutter, E, substantially in the manner and for the purpose herein specified.

2d, The slots, L L, in the cutter arm, A, whether said arm be for a rotary or any other kind of cutter, where said slots are used to allow of vertical adjustments of said cutter, substantially in the manner and for the purpose herein specified.

3d, The pin, C, when said pin serves both to secure the collar, M, on the spindle, A, and to limit the rotary or caster motion of the cutter, E, in the manner and for the purpose herein specified.

76,344.—COFFIN.—Collins Potter, Pawlet, Vt., and Eleazer Jones, Middle Granville, N. Y.

We claim, as a new and improved article of manufacture, a coffin, constructed substantially as herein described.

76,345.—CHEESE HOOP.—Stephen Purdy (assignor to himself and Ellis Ellis), Whitestown, N. Y.

I claim, 1st, Constructing cheese hoops with a side opening, or openings with a flange on each side, and a clamp or clamps to hold them together, in the manner substantially as described and for the uses and purposes mentioned.

2d, The said hoop with openings, flanges, and clamps, in combination with the plate, A', constructed and operating as described and for the uses and purposes mentioned.

3d, The said hoop with the openings, flanges, and clamps, in combination with the spring or catch, D, and the cross openings, B4 and B5, constructed and operating substantially as described and for the uses and purposes mentioned.

76,346.—CHRONOMETER ESCAPEMENT.—George P. Read, Boston, Mass.

I claim the mode, substantially as herein shown and described, of applying the feather or the hair spring of a chronometer or watch escapement, that is, by means of the saw kerf, e, and screw, f, substantially in manner and for the purpose as before explained.

76,347.—BUTTONHOLE FOR PAPER ARTICLES OF WEARING APPAREL.—William C. Reeves, Boston, and Louis L. Solomon, Charlestown, Mass.

We claim the buttonhole, as composed of a close straight slit, a a, and a hole, B, arranged together, substantially as represented in fig. 1 of the above-mentioned drawings.

76,348.—RAILWAY.—Elisha Robbins, Worcester, Mass.

I claim, in combination with an iron rail, a metallic chair or supporter, C, to receive it, and extend longitudinally and continuously under such rail, and from end to end of it, and upon a series of ties, or their equivalent, and lap on either or both flanges of the base of the rail, as specified.

Also, such a chair, as made or divided lengthwise in two parts, with a lip or flange to each, to grasp and extend over the base of a rail, as specified.

Also, in combination with two parallel rails, A A, of a railway, the cross or duplex chair, D, made with lips to grasp the bases of the opposite rails, or two longitudinal chairs or supporters, C C, applied thereto in manner as specified,

Also, the combination of the metallic brace E, with the parallel rails, A A, and the transverse or duplex chair, D, applied to such rails, or to their longitudinal metallic supports or chairs, C C, as explained.

76,349.—SCROLL SAW MILL.—Elisha Robbins, Worcester, Mass.

I claim the combination of the sliding counterbalance weight, its connecting rod and operative crank, with a saw and frame, and the connecting rod and crank thereof, the whole being constructed and arranged to operate substantially as specified.

76,350.—CHURN.—Timothy Rose, Cortlandville, N. Y.

I claim, 1st, The solid divider, when of less hight than the depth of the cream chamber, in combination with a rocking churn, for the purpose herein described.

2d, The double wedge-shaped divider, G, having an automatic rising and falling motion, deprived from the combined action of the churn and cream, for the purpose of opening a passage beneath it from end to end of the chamber, as herein described.

3d, The fixed beaters, made concave on their under sides, forming a series of air chambers, as herein described.

4th, The rockers, having their front ends made of curves, whose radii are less than the curves of their rear ends, and providing the latter with springs, for the purpose herein described.

5th, The arrangement of the seat, D, platform, E, and vertical hand lever, F, in combination with a rocking churn, as herein described.

6th, The air tube, J, having a hood, K, at its outer end, and a valve, l, within its inner end, when applied to a rocking churn, as herein described.

76,351.—SCREW CUTTING MACHINE.—Edward Royon, Piqua, Ohio.

I claim, 1st, As herein arranged and for the purpose explained, the hollow die chuck, E, having the permanent head, F, clip, G, with opposite eccentric arcs, g g', sliding jaws, H, notched revolving ring, I, eccentric, i' i", and plate, J.

2d, The combination of the hollow shaft, B, die chuck, E, jaws, H, adjustable dies, K, and bolts, L.

3d, The notched and adjustable plate, M, and tightening screw, N, in combination with the tumbler, P, ring, I, and spring, Q.

4th, In combination with the screw-threading machine herein described, the right and left screw, t t', jaws, t" t"', socket, W, and nut, X, all arranged as set forth.

76,352.—HORSE HAY FORK.—Peter Schwitzer, Robeson Township, Pa.

I claim the arrangement of the slotted frame, D, double-jointed levers, E E, and connecting rod, F, as herein described and for the purposes set forth

76,353.—ANKLE BRACE.—Samuel B. Shearer, Aurora, Ill.

I claim the supporter, A, in combination with the straps, B and D, and lacing, C, or their equivalent, for the purpose and substantially as herein specified.

76,354.—CHILDREN'S CORSETS.—Martha B. Solomon, Charlestown, assignor to Louis L. Solomon, Charlestown, and William C. Reeves, Boston, Mass.

I claim, as a new article of manufacture, a child's corset and underclothes supporter, with two series of bone and wicking receptacles or pockets, combined with the body, as set forth, such body being provided, as described, with rows of buttons for supporting skirts and drawers, arranged and operating in the manner as shown and described.

76,355.—CARPET STRETCHER.—Levi B. Southworth, Deep River, Conn.

I claim the joint, B one or more points, C, and brace, E, in combination with the head, D, as and for the purpose specified.

75,356.—HAME LOCK.—Joseph A. Stansbury, Marion, Iowa.

I claim, 1st, The slotted lever, C, when used as and for the purpose specified and set forth.

2d, In combination with the manner of binding the lever, C, in its proper position by the tendency of the two curved plates, A and E, to straighten when under lengthwise strain, as within substantially described.

76,357.—MODE OF ATTACHING SHAFTS TO VEHICLES.—Smith Thompson, Montgomery county, Md., assignor to S. S. Fahnestock, Washington, D. C.

I claim the jointed bar, C, constructed and operated in the manner substantially as shown and described and for the purpose set forth.

76,358.—ELECTRIC TELEGRAPH.—Cromwell Fleetwood Varley, New York city.

I claim, 1st, Making insulators for telegraph wires of two or more insulating caps, exclusive of the cement which unites them, each cap being a complete insulator in itself, so that if one of the caps be defective, the other or others shall arrest the electric current, as set forth.

2d, The use of a non-conducting pin inside an insulating cap, such pin being constructed of iron or steel covered with hard rubber, or being formed of stoneware or porcelain, substantially as described.

3d, Glazing the lower part of porcelain or stoneware or earthenware caps, and leaving the upper part unglazed, substantially as and for the purposes set forth.

4th, Making the lower edge of the insulator cap externally sharp, but internally rounded, so that drops of rain, when blown outward, shall fall off, and when blown inward shall not break off, but run, by capillary attraction, up the rounded surface out of the wind, substantially as set forth.

5th, Making porcelain or stoneware or earthenware caps with two or more projecting ears, in combination with and arranged above and below the groove for the wire, so that when the insulator is inclined to the wire, the latter can be inserted, but when at right angles to it, the latter cannot be gotten out, as set forth.

76,359.—DITCHING MACHINE.—John Vaughn, Miami county, and Eli Chamnes, Grant county, Ind.

We claim the combination and arrangement of the wheel, B, jack or cleaner, G, framing, A, dashboard, g, feet, d, and bandles, c, substantially in the manner and for the purposes as herein set forth.

76,360.—DROP LIGHT FOR CHANDELIERS.—Wm. C. Yosburgh, Brooklyn, N. Y.

I claim, 1st, The case, B, having the longitudinal slot and notches, I I, to catch and retain the pin, N, so that the drop light may be retained at any desired hight.

2d, The case, B, made as described, in combination with the flexible tube, C, pulley, P, and weighted disk, D, substantially as and for the purposes herein set forth and described.

76,361.—APPARATUS FOR TAKING SOUNDINGS.—Thomas Walker and Thomas F. Walker, Birmingham, England. Patented in England Dec. 30, 1866.

We claim, 1st, The combination and arrangement of the disk plate, e, provided with numbers to correspond with the movements of one or the indicating wheels, and connected by spring pressure, so as to move with such wheel, when geared to give motion to another indicating wheel, so that any movement given to said plate may simultaneously effect the corresponding movement of such other indicating wheel, substantially as set forth.

2d, The application of the spring click, l and stop, k, to the disk plate, e, to indicate the point of starting, substantially as shown and described.

3d, The application of the notches, j j, or equivalent, in combination with the stop, k, to the disk plate, e, in order that the distance of its partial rotation may be ascertained by feeling the same after use, substantially as set forth.

4th, The application of a rope, s, or equivalent connection, between the sounding machine and the weight used to aid the descent of such machine, for preventing the action of the indicating devices from being impeded by the "wake" of such weight, as set forth.

76,362.—CORN POPPER AND COFFEE ROASTER.—L. A. Warner, Freeport, Ill.

I claim, 1st, The outer movable cylinder or jacket, constructed so as to be removed at pleasure, when used to inclose a wire cloth cylinder, with a space between, in the manner substantially as described and for the purposes set forth.

2d, The cylinders, A and X, combined so as to be convertible into an open popper or a tight roaster, in the manner described, and combined with the holes, d and i, and plate, g, the holes, e, caps, f, axle, B, and handle, C, in the manner substantially as described and for the purposes set forth.

76,363.—WOOD TURNING LATHE.—Wm. J. Watson, Benton Center, N. Y.

I claim a tail block having a pair of movable center holding jaws, e, when the securing devices for the tail block and the operating devices for the said jams act in conjunction, substantially as and for the purpose set forth.

76,364.—FURNACE FOR SMELTING LEAD ORE.—David P. Webster, New York city.

I claim, 1st, The method herein described of forming the interior or lining of furnaces, that is to say, by building the bed, walls, and arch of the plastic material herein described, or the substantial equivalent thereof, in the manner shown and specified, and subjecting the same, when formed into shape to heat, as herein set forth.

2d, The use and employment of the ingredients herein described, for repairing cracks or other injuries, or parts worn by the action of fluxes, substantially as herein set forth.

3d, The combination with the furnace of an iron casing or pan under the arrangement herein shown and described, so as to support the plastic structure of the furnace, and also to allow free passage of air under and around the same, as and for the purposes set forth.

76,365.—RAILWAY FROG.—George Westinghouse, Jr., Schenectady, N. Y.

I claim the arrangement of a chair, c, under one or both ends of the frog A, substantially as and for the purpose described.

76,366.—LANTERN.—Wm. Westlake, Brooklyn, N. Y.

I claim, 1st, Constructing the base or support of a lantern entirely of wire, or, open, so as not to materially obstruct the passage of the light downward, substantially as specified.

2d, Connecting the open or wire base, F L, and the guard to the band, C substantially as specified.

3d, The ledge H H', bead or wire, G, in combination with the band, C, and lamp, I, substantially as and for the purposes specified.

4th, The eyes or loops, J, for securing the guard and base to the band, C, substantially as specified.

5th, Making the vertical guard wires, E, and the base wires, F, of the same piece of wire, substantially as specified.

76,367.—MANUFACTURE OF SPOUTS FOR TEAPOTS.—William Westlake, Brooklyn, N. Y.

I claim the method herein described of forming curved or bent spouts of a single piece of sheet metal, substantially as specified.

76,368.—CAR COUPLING.—Edwin R. Whitney (assignor to himself and Joseph Frazer), Plattsburg, N. Y.

I claim, 1st, The construction of the revolving four-armed cross, C, pivoted dog, D, bent spring, E, lever, F, and bar, b, all arranged and operating as described, for the purpose specified.

2d, The above in combination with the pawl, c, fitting into a recess in a lug, d, projecting from the lever, F, as set forth.

76,369.—HARNESS.—Wm. S. Wood, Hatborough, Pa.

I claim a harness composed of open collar, with permanent hames, H H', rope or strap, a b, spring hook, k, all combined and constructed and operating in the manner and for the purposes above set forth and described.

76,370.—CLOCK.—Robert Woolworth, New Haven, Conn.

I claim, 1st, The count wheel, D, divided substantially in the manner described, so that in the revolution of the said wheel, the count hook will fall into the proper slot to arrest the movement of the wheel at the proper time, and so that the given number of revolutions more than one of the said wheel will complete the strokes required for each twelve hours, the said wheel at the completion of such number of revolutions arriving at the point of starting, as herein set forth.

2d, The combination of the count wheel, D, and pinion, I, each bearing to the other the relative proportion, and so as to operate substantially as specified.

3d, The arrangement of the strike wheel, F, with the count hook, and combined with the count wheel, D, so as to operate substantially as set forth.

76,371.—POTATO DIGGER.—B. P. Wright, San Francisco, Cal.

I claim a potato digger having the spade, D E, the inclined carrying or elevating belt, G, and the belts, J J, together with the cleaning sieve, K, the whole constructed and operating substantially as and for the purposes herein described.

76,372.—EXPANDING MANDREL.—David L. Allen, Williamsport, Pa.

I claim the combination and arrangement of the chuck, annual plates, C set screws and springs, D, connecting screw, R, with the arbors, A and B, and cones, A A and B B, substantially in the manner and for the purposes as herein set forth.

76,373.—PAPER CUTTING MACHINE.—J. Lathrop Allen (assignor to himself and Marshall Lefferts), New York city.

I claim providing the reciprocating shear, having fixed inclines for closing the shear, with adjustable links and cranks for reciprocating said shear, substantially as set forth.

76,374.—BREECH-LOADING FIRE-ARM.—Chas. H. Alsop, Middletown, Conn., assignor to Joseph W. Alsop, New York city.

I claim, 1st, The spiral spring, c, in combination with the groove, a, in the plate, B, the rib, b, upon the under side of the barrels, the perforated lip, D and the vertical pin, E, having a beveled end, all arranged as described whereby as the pin, E, is raised by the spring lever, F, the spring, c, throws the barrels forward, for the insertion of the cartridge, as herein shown and described.

2d, The catch or fastening composed of the vertical pin or bolt, E, fitted in the breech, and pivoted to the spring lever, F, in combination with the perforated lip, D at the under side of the rear of the barrel or barrels, and the recess, e, in the breech, to receive the lip, all arranged substantially as and for the purpose specified.

76,375.—ROOF.—Edward Atkinson, Wrightstown, Pa.

I claim a roof consisting of slats covered with layers of cement, between which is interposed a sheet of felt, substantially as described.

76,376.—COFFIN.—Samuel Avery and Lewis Delill, Phœnix, N. Y.

We claim as a new article of manufacture, a wooden coffin having its parallel sides formed without bending the timber, substantially as and for the purpose set forth.

76,377.—WHIFFLETREE HOOK.—Chas. B. Babcock, Frankfort, N. Y., assignor to himself and D. M. Golden, Frankfort, and B. G Eaton, Mexico, N. Y.

I claim, 1st, The cylinder A, provided with projections, a and b, and groove or slot, c, substantially as and for the purpose set forth.

2d, In combination with the above the hook, B, substantially as and for the purpose specified.

76,378.—CONSTRUCTION OF ICE PITCHERS.—Jacob B. Bailey (assignor to the Bailey Manufacturing Company), New York city.

I claim, 1st, The foot or socket, e, of the inner bottom plate, c, extending downward into the projection, g, of the bottom, d, substantially as set forth.

2d, The protecting plate, f, in combination with the double bottom of the ice pitcher or water cooler, said protecting plate being introduced within the pitcher, and secured substantially as set forth.

76,379.—MUCILAGE BOTTLE.—H. O. Baker, New York city

I claim the wire, or its equivalent, in combination with the groove at the base or in the neck of the bottle, substantially as and for the purposes as herein set forth.

76,380.—NUT FOR JOINT BOLTS.—James Baldwin, Manchester, N. H.

I claim a joint bolt nut having a concave face, essentially in manner and for the purpose as herein shown and described.

76,381.—STEAM GENERATOR.—William Ball, Chicopee, Mass.

I claim, 1st, In a stationary horizontal flue boiler, a fire box made open from bottom to top, and without a crown sheet.

2d, The water tubes, c c, extending across the upper part of the fire box, and entering the water spaces at the sides or ends of the fire box, as described, in combination with a covering of fire brick, or other like material, the whole arranged and operating substantially as described, and constituting a substitute for the crown sheet usual over the fire box of stationary steam boilers.

76,382.—APPARATUS FOR TREATING FRACTURES AND DISLOCATIONS.—Elizur H. Barnes, Marathon, N. Y.

I claim, 1st, The curved forms or rests, K and C, when used respectively upon the leg or arm, in combination with the parts, I F and G.

2d, The rod, D, when bent as represented at its upper end, in combination with the said parts, I F and G, for the purposes set forth.

3d, The rod, B, and rest, A, in combination with the parts, D I F and L, for the uses and purposes set forth.

76,383.—SKATE.—E. H. Barney, Springfield, Mass.

I claim a skate fastening having the sharp or safety edge, d, formed upon the outer and lower portion of the clamp, when constructed and operating substantially as herein described and for the purposes specified.

76,384.—SAWMILL.—David B. Bartholomew, Lancaster, Pa.

I claim, 1st, The combination of the movable frame, I' H', carrying the feed rollers, I I and H H, with the slotted post, h h, rack, V, pinion, W, weighted pulley, Q, hand screw, U, and latch, x x, when constructed, arranged, and operated in the manner and for the purposes described.

2d, The hinged slotted bar, E, upon which are saw guard, D, pins, p p, and wedge roller, F, all constructed and operating substantially as described.

3d, The deflecting device, when constructed with the rollers, n n and o and operating substantially as set forth.

76,385.—SEWING MACHINE.—J. W. Bartlett, New York city

I claim, 1st, In combination with the rods, C and F, the internally toothed gear wheel, B, pinion, R, eccentric, D, rod, E, and hook, G, constructed, arranged, and operating substantially as and for the purpose set forth.

2d, In combination with the rods, C and F, the, eccentric, D, rod, E, cam, H hook, G, spring, L, feed dog, J, and screw, K, constructed and operating substantially as and for the purposes set forth.

76,386.—PAINT MILL.—Charles Belcher, Newark, N. J.

I claim the two revolving grinders, A and B, the upper one about half the size of the other, when combined with the scraper, C, arranged and operated relatively to each other as above described, and for the purpose set forth.

76,387.—FISHING ATTACHMENT FOR VESSELS.—Thomas Bell, Bellport, N. Y.

I claim a device for catching fish constructed and applied to a vessel substantially in the manner as herein set forth.

76,388.—THERMOSTATS.—Karl Bender and Chas. F. Teller, Banhofe Offenbach, A. M., Grand Duchy of Hesse, assignor to Martin Lochner, Newark, N. J.

We claim, 1st, The coiled plate, F, in combination with a register, R, and the arm or lever, D, or its equivalent, all arranged substantially in the manner as and for the purpose set forth.

2d, The screw rod, I, and bent arm, L, for adjusting the arm or lever, D, to regulate the temperature of the room, substantially as shown and described.

3d, The index crank, J, on screw rod, I in connection with the graduating

© 1868 SCIENTIFIC AMERICAN, INC.

dial plate, K, bent arm, L, and the arm or lever, D, all arranged substantially as and for the purpose set forth.

76,389.—FLUTE.—Theodore Berteling, New York city.

I claim the adjustable set screws, C, in connection with the keys, B, of a flute, operating in the manner and for the purpose substantially as described.

76,390.—DEVICE FOR KEEPING FOOD WARM.—Edward Bevan, Birkenhead, for himself and Margaret Fleming, Shipston-on-Stour, England, administratrix of the estate of Abel Fleming, deceased, assignors to Edward Bevan.

We claim the within described means or apparatus for warming and keeping warm, articles of food, consisting substantially of the removable vessel b, heating agent, space, and a vessel, a d c, air space and vessel, i g, or its equivalent, and a non-conducting cover, combined in the manner set forth.

76,391.—EDGE FINISHING TOOL.—John B. Blanchard, Marlboro, Mass.

I claim combining with the flanged body of an edge finishing tool, a spring worked gage, substantially as and for the purpose described.

76,392.—APPARATUS FOR EVAPORATING CANE JUICE.—Thérence Boutté, New Iberia, La.

I claim the furnace, A, and flue, E, when these parts are severally constructed, united, and operate as herein described, in combination with the kettles, D, when the whole constitutes a portable cane juice evaporating apparatus, as and for the purpose set forth,

76,393.—WASHING MACHINE.—Elijah Y. Boyce, Middlebury, Vt.

I claim an improved washing machine consisting of the frame, B, stationary dasher, C D, box, A, bar, a, rod, b, eye, E, and lever or rod, G, all constructed, arranged, and operating as described and specified.

76,394.—DUMMY FOR DISPLAYING CLOTH.—W. E. Brock, New York city.

I claim the dummy composed of the paper or papier mache shell, A, head piece, a, supporting shaft, B, base, C, and braces, b, the whole arranged substantially as and for the purpose specified, as a new article of manufacture.

76,395.—SAW.—Ira S. Brown and Chas. N. Brown (assignor to themselves and J. Mason Gross), Providence, R. I. Antedated Jan. 3, 1868.

We claim the combination of a cutting and planing tooth in one and the same piece of metal, constructed and operating substantially as above specified.

76,396.—MUSICAL RETURN BALL.—John Burke, Brooklyn, N.Y.

I claim as a new article of manufacture a return ball, A B, having a perforation, a', in which a musical reed, C, is placed, as described.

76,397.—HOT AIR FURNACE.—H.G.Burr, Minneapolis, Minn.

I claim, 1st, The arrangement and combination of the chambers, G H J and K, in a hot air furnace, substantially as shown and described.

2d, The annular flues, a and a', in combination with the chambers, H and K, as and for the purposes set forth.

76,398.—WATER CLOSET.—Wm. S. Carr, New York city.

I claim, 1st, The stationary overflow vessel, e, introduced within the upper end of the hopper, d, and receiving the lower end of the basin, f, in combination with the valve, k, on the spindle, l, and the flexible packing, h, applied to the lower end of the overflow vessel, e, in the manner and for the purposes set forth.

2d, The valve, k, attached to a plate and connected by the arms, 2 and 3, to the spindle, l, in combination with the flexible ring, forming a packing and seat for said valve, substantially as set forth.

3d, The spindle, l, for the valve, having a close bearing at one end, and formed with an arm, m, at the other end, and connected to and combined with the valve in the manner specified, so that the spindle can be inserted endwise, and connected with the valve, without disconnecting any of the parts of the hopper.

4th, The reversible screw bridge, t, formed as specified, in combination with the cup or socket, q, whereby the said cup or socket can be firmly secured to the varying thicknesses of wood work of the seat, as set forth.

5th, An elastic packing or seat for the valve, k, composed of a cylinder of vulcanized rubber, stretched upon the bottom flange of the overflow vessel, e, and forming a loose or free inner edge to receive the pressure of the superincumbent water in the overflow vessel, and form, with the valve, a water tight joint, as specified,

76,399.—POTATO-WASHER AND PAN COMBINED.—Joseph M. Chaplin, Morrisville, Vt., assignor to himself, E. E. Allen, and F. M. Loveland.

I claim the cylindrical potato washer, A, with its bars, C C, and movable hooked journal, B, in the one end, and lid, B, and crank, E, at the other end, when constructed and combined with the tin pan, G, as herein described, and for the purpose set forth.

76,400.—STOVE.—Joseph Collins, and John Knox, Conshohocken, Pa.

We claim the stove constructed as described, and consisting of the air chamber, C, fire back, D, having spaces, b, tubular sides, F, grate composed of single bars, E, bar, I, oven, B, and flues, f G h, all arranged as described.

76,401.—HAIR CRIMPER.—S. F. Conant, Skowhegan, Me.

I claim the series of spring plates, A A, pivoted together, substantially as described.

76,402.—SAP SPILE.—Williston Conner, Renselaerville, N.Y.

I claim, 1st, An improved sap spile, cast hollow, and with a circular flange, B, cast upon its inner end, said flange having its edge bevelled, and having two prongs, C, cast upon its inner side, substantially as herein shown and described.

2d, The combination of the inclined and notched arm or flange, D, with the body or stem, A, of the spile, substantially as herein shown and described, and for the purpose set forth.

76,403.—WATER CLOSET.—Hugh H. Craigie, New York city. Antedated April 1, 1868.

I claim, 1st, A pan, formed as a section of a globe, or nearly so, and mounted substantially as specified, so as to move nearly in the line of its own curvature, in combination with a water closet basin.

2d, A hollow arm, extending out on one side of the hopper, in combination with the pan fitted to be moved, as specified, by mechanism introduced within said arm, substantially as set forth.

3d. The combination of a pan, made and moving as specified, with a water closet basin, and metallic hopper extending up around said basin, as and for the purposes set forth.

4th, The annular water way, s, in combination with the deflector, u, with an opening through it, in the manner and for the purposes set forth.

76,404.—DEVICE FOR SCARIFYING THE SOIL PREPARATORY TO PLOWING.—Elisha Crane, Elkhart, Ill.

I claim, 1st, The truck frame, B B, where the same is provided with a series of parallel rods or axles, B' B', when the same are provided with a series of cutting blades or disks, b b, and the whole is constructed and arranged so as to operate substantially as described, and for the purposes specified.

2d, The truck, B, when the same is in combination with the uprights, a a, and wheels, a' a', and the whole is so constructed as to operate substantially as described, and for the purposes specified.

3d, The truck, B, rods or axles, B'. cutting blades or disks, b, when the same is in combination with the windlass rollers, c c, and its operating mechanism, and the whole is so constructed and arranged as to operate substantially as described, and for the purpose specified.

4th, Arranging above the truck, B, when the same is provided with parallel rods or axles, B' L', and cutting blades or disks, b b, of the platform, F, and driver's seat, g, when the whole is so constructed and arranged as to operate substantially as described, and for the purposes specified.

76,405.—BRICK MACHINE.—William Chrighton, and Henry Roesler, Fort Wayne, Ind.

We claim, 1st. The rocking shafts, F F, in combination with bar, G, as and or the purpose described.

2d, The lifters, O O, operating as and for the purpose set forth.

3d, The combination of rocking shafts, F F, with lifters, O O, bar, G, and spring, q, substantially as set forth.

4th, The plungers, P P, provided with rollers, x x, rail, W, slides, p p, rocking shafts, F F, and lifters, O O, all combined and arranged as and for the purpose set forth.

76,406.—HARNESS OPERATING MECHANISM FOR LOOMS.—George Crompton, Worcester, Mass.

I claim the combination and arrangement, in a loom for weaving fancy or other goods, of a series of cams, when made as shown in fig. 5 of the drawings, with a series of jacks, G, having a series of notches, 6, substantially as and for the purposes set forth.

76,407.—BALING PRESS.—David Cumming, Jr., New York city, assignor to himself and J. C. Cameron.

I claim the combination of the eccentric wheel, F, in its movable bearings G G, with driving wheel, I, stud, N, follower, C, racks, E E, and pawls, H H, and L L, all arranged and operating substantially as set forth.

76,408.—SOLE-CUTTING MACHINE.—Timothy A. Curtis, Brookfield, Mass.

I claim, 1st, Securing the knife to the head, by means of the bolts, in connection with the racks and pinion, or other means of adjusting them, substantially the same, when constructed in the manner and for the purposes and operating substantially the same as above set forth and described.

2d, The adjustable gages, attached to head, C, substantially as described.

76,409.—INKSTAND.—Samuel Darling, Bangor, Me.

I claim, 1st, An inkstand, having an elastic ink-reservoir, C, a dipping cup, K, and a presser, F, constructed and operating substantially as described.

2d, An inkstand, having, in combination, an elastic or flexible ink reservoir, a pen dipping cup, and an intermediate ink chamber, arranged and operating substantially as described.

3d, An inkstand, having, in combination, an elastic ink reservoir, a follower, an intermediate ink chamber, and a pen-dipping cup, substantially as described.

76,410.—VISE.—Samuel Darling, Bangor, Me.

I claim a vise handle holder, constructed and to be applied to the handle, substantially as and for the purpose described.

76,411.—CULTIVATOR.—Elijah W. Dennis, Peoria, Ill. Antedated March 25, 1868.

I claim, 1st, The arrangement of the levers, I I, and cord, z, with spring, h, on the pole, M, substantially as and for the purpose specified.

2d, The arrangement of the levers, handles, H H, with the cord, x, and the pole, M, substantially as and for the purpose specified.

3d, The arrangement of the plates, s and t, as constructed, with the shovel, y, and bolt, w, for securing the shovel to the beam, substantially as and for the purpose set forth.

76,412.—CULTIVATOR.—G. W. Deweese, Lima, Ohio.

I claim the adjustable arms, C, and handles, a, combined with the draft beams of a cultivator, substantially as and for the purpose set forth.

76,413.—PROCESS OF EXTRACTING GOLD FROM ITS ORES.—Rudolph D'Heureuse, San Francisco, Cal.

I claim the process herein described for extracting gold, by passing gold-bearing substances, reduced to a fine powder, without previous alloy, through melted zinc, by introducing said substances below the surface of the melted zinc, as set forth.

76,414.—COMB.—Josiah S. Dickinson, Essex, Conn.

I claim, as a new article of manufacture, a comb-holder, A, constructed substantially as described.

76,415.—BRICK MACHINE.—Lewis Dieterich, Sandwich, Ill.

I claim, 1st, The followers, composed of the parts, D E, and F, in combination with the beams, H, guides, Z and S, and lever, P, substantially as specified.

2d, The arrangement of the bar, D, beam, H, pendants, 1, and rock shaft, J, with the slotted or grooved bars, S, so that the operating parts can all be readily removed, substantially as herein described.

3d, The combination and arrangement of the lever, O, rock shaft, J, provided with the eccentrics, k, the removable standards, M, and pendants, l, guide bars, S, and followers, D E F, with frame, A B, all constructed and operating substantially as specified.

76,416.—APPARATUS FOR RAISING SUNKEN VESSELS.—Count Arthur Dillon, Paris, France.

I claim, 1st, The ballast compartments, B, with the hinged traps, D, for discharging the ballast from a submerged pontoon, substantially as and for the purpose shown and described.

2d, The apparatus, as shown and described, consisting of a cylinder, with pistons and generating chamber, for employing the buoyant force for raising the pontoon after it has been carried down in a latent state, all substantially as shown and described.

76,417.—COAL MINING MACHINE.—George Edmund Donisthrope, Leeds, England. Patented in England, October 28, 1863.

I claim, 1st, The application of wedges to secure or hold the carriage to the rails, substantially as herein described; and

2d, The application of clearers or clearing instruments to the picks, or cutting tools, substantially as herein described,

76,418.—COAL MINING MACHINE.—George Edmund Donisthorpe, Leeds, England. Patented in England, March 8, 1866.

I claim the holding in position of the rails upon which machines used in getting coal and other minerals run by posts or pillars wedged or held between the floor and roof of the mine, substantially as herein described.

76,419.—COAL MINING MACHINE.—George Edmund Donisthrope, Leeds, England. Patented in England, March 8, 1866.

I claim the so mounting the cutting apparatus of machinery employed in getting coal or other mineral, that the cutting apparatus may, while at work, rise or fall independently of the truck or carriage of the machine, substantially as herein described.

Also, the carrying the cutting apparatus on the top of the plunger of an air cylinder, carried by the truck of the machine, so that the cutting apparatus may cut a groove close up to the roof of the mine, substantially as herein described.

76,420.—EYE GLASS ATTACHMENT.—Julius Dorn, New York city.

I claim the combination of the springs, B d, and rigid nose piece, m, with the eyeglasses, as herein described, for the purpose specified.

76,421.—DEVICE FOR MOVING CARS.—Joseph Douglass, Mc. Connellstown, Pa.

I claim, 1st, The combination of the lever, G, cap, C, and sliding check, H, when arranged so as to operate together substantially in the manner and for the purposes specified.

2d, The combination of the cap, C, spring, D, and blade, E, for the purpose of supporting and holding the other parts of the instrument in position, substantially as specified.

76,422.—DOUBLE-ACTING HINGE.—George Dumbolton (assignor to himself and C. H. Slicer), Baltimore, Md.

I claim the applying of two torsion springs to the swinging leaves or straps of a double action hinge, substantially as and for the purpose described.

76,423.—CABINET BEDSTEAD.—William H. Dutton, Philadelphia, Pa.

I claim, 1st, The straps, D, and curved bars, C, in combination with the parts, A B, of the bedstead, arranged and operating substantially as and for the purpose set forth.

2d, The adjusting or moving of the legs, E E, automatically, by the raising or lowering of the bedstead, through the media of the coil springs and cords, arranged substantially as shown and described.

76,424.—CAR REPLACER.—David Edwards, New York city.

I claim, 1st, The combination with the car, at or near either or both of its ends, of a transverse intermediate ground rest or bearing, capable of being raised or lowered, substantially as and for the purpose specified.

2d, The combination with a street or other railroad car, of the screw, E, screw box, G, and wheel or roller, H, the latter having its axis arranged transversely, or thereabouts, to that of the running wheels, and intermediately of the same, and capable of being raised or lowered, essentially as herein set forth.

76,425.—SPRING BED BOTTOM.—B. C. English, and Francis Fraps, Springfield, Mass.

We claim, 1st, The double slat or frame, A, consisting of top and bottom slats, C and D, with springs, E, between them, and connected at their ends by means of the blocks, G, screws, a, and washers, b, substantially as described.

2d, The arrangement of the frames, A, upon cross rods, B and B, so as to be adjustable by set screws, f, in the manner shown.

76,426.—LAMP BURNER.—Luther Erving, Brooklyn, N. Y.

I claim the arrangement of the foraminous case, C, cap, D, and perforated plate, b, with relation to the wick tube and base, all combined substantially as shown and described.

78,427.—POTATO-DIGGER.—Lewis Finch, Vienna, Va.

I claim, 1st, The double mold board, adjustable on the beam, B, and provided with horizontal and vertical cutting edges, as shown and described, and for the purposes specified.

2d, The combined arrangement of the double mold board, F F', convex share, C, and screen, D, all constructed and operating as and for the purposes specified.

3d, In combination with the above, the pivoted rake, H, for finally separating the potatoes from the earth, as described.

76,428.—ADJUSTABLE SEAT FOR CARRIAGE.—James Fleming (assignor to Gardner and Fleming), Philadelphia, Pa.

I claim the seat, G, hung to arms, E E, hinged to the body of a vehicle, in combination with guides or plates having stops, c c', e e', and secured to the body of the vehicle and to the seat, so that the seat is retained in its horizontal position both when adjusted to accommodate the driver and when adjacent to the dasher board as described.

76,429.—DEVICE FOR CONVERTING MOTION.—M. M. Follett, Westboro, Mass.

I claim the combination and arrangement of the devices, substantially as and for the purpose herein described.

76,430.—MOP-WRINGER.—M. M. Follett, Westboro, Mass.

I claim the squeezing roller frame, hinged to the oscillating post, and connected at its opposite end to the platform, by the adjustable connection described, all substantially as and for the purpose set forth.

76,431.—BOOT AND SHOE STRETCHER.—William Frederick, Pottsville, Pa.

I claim the combination of the lever, C, and screw, E, with the parts, A and B, of the last, substantially as herein shown and described, and for the purpose set forth.

76,432.—BENDING MANDREL.—Carlos French, Seymour, Conn.

I claim a mandrel, composed of an interior shaft, with a shoulder or recess therein, and an eccentric slotted clasp or sleeve on its perimeter, that can move over or past said shoulder, to catch and hold or release the end of the metal bent or wound therein, substantially as described and represented.

76,433.—MACHINE FOR PRINTING ADDRESSES OF NEWSPAPERS, ETC.—John C. Gaither, Somerset, Pa.

I claim the combinations of the following elements, viz., the treadle, I, the lever, L, and press rod, M, having an elastic faced point, M', the feed finger, O, the wheel, C, with an adjustable side plate, C', sector plates, G, type, D, wedges, E, and partitions, F, and the plate, N, with opening, N', said parts being arranged in relation to one another, substantially as and for the purpose set forth.

76,434.—BRACKET SHELF AND DRAWER.—Lewis Gibbs, Canton, Ohio.

I claim a bracketed shelf, with ornamented or plain railing or guard around its margins or edges, and with a drawer, substantially in the manner and for the purpose herein described and represented.

76,435.—REGISTER.—Harlow Gilbert, New York city.

I claim, 1st, The combination of the side plate, A, dial plate, B, thumb piece, C, milled or roughened roller, D, having one or more teeth formed upon it, gear wheels, F G H I, or their equivalents, horizontal gear wheel, J, and index finger, K, with each other, substantially as herein shown and described.

2d, In combination with the above, the tooth, L, on wheel, J, and the horizontal toothed wheel, M, arranged and operating substantially as described, and for the purposes specified.

76,436.—HARVESTER.—Alvaro B. Graham, Waukegan, Ill.

I claim the combination of the finger beam of a harvester, with a revolving shoe, through the intervention of friction wheels, substantially as before set forth.

Also, the combination of the finger beam, revolving shoe, and sliding arm of the bearing that holds the revolving shoe in place, substantially as before set forth.

Also, the combination of the members of a hinge joint, with a split tubular joint pin, substantially as before set forth.

Also, the combination of the joint pin of a hinge joint, with a spring holder and teat, substantially as before set forth.

Also, the combination of the bolt head or nut, with the springlatch and ratchet teeth, substantially as before set forth.

76,437.—COOKING RANGE.—William H. Graham, La Crosse, Wis.

I claim, 1st, The adjustable fire box top, F, constructed with a concavity on the under side of plate, h, for the purpose of allowing the products of allowing the products of combustion to pass from the chambers around the ovens to the pipe, substantially as described.

2d, The circular lid, P, provided with receptacles for cooking utensils, arranged in combination with fire box, F, of a cooking range, substantially as set forth.

76,438.—POTATO-DIGGER.—Alvah Graves, Marcellus Falls, N.Y.

I claim, 1st, The serrated wheel, D, when so constructed with relation to the riddle, C, that the lower portions of its teeth engage with the ground, to propel the wheel, while the upper portions engage in tossing the riddle, substantially in the manner and for the purpose set forth.

2d, The shovel plow, A a B F, hinged riddle, C c, and serrated wheel, D, all constructed, combined, and operating in the manner shown and for the purpose described.

76,439.—WHIRLIGIG TOY.—John Groves and E. B. Turner, Providence, R.I.

We claim the combination of a shaft with a piece of elastic, passing longitudinally through the handle of the toy, and operated substantially as described.

76,440.—PRINTERS' FURNITURE.—F. T. M. A. Guyon, Saint Brieux, France.

I claim, 1st, The part, K K, and the part, J j, arranged to operate relatively to each other and to the bed of a printing press, as and for the purpose herein specified.

2d, The tenons or spurs, k k, and screw, V, in combination with the readily adjustable frame, K K', J j, or its equivalent, the several parts being all arranged for joint operation, as and for the purpose herein specified.

76,441.—CLOTHES DRYER.—E. R. Hall, Utica, assi nor to himself, D. M. Golden, Frankfort, and B. G. Eaton, Mexico, N. Y.

I claim, 1st, The springs, s s ss, for throwing out the arms, h h, substantially in the manner specified.

2d, The combination of the elevator, C, springs, s s s s, and arms, h h, substantially as and for the purpose set forth.

3d, Arms, h h, springs, s s, elevator, C, spools, e e, and tape or cords, f, a arranged substantially in the manner and for the purpose described.

76,442.—LINING OF FURNACES.—B. B. Haycock, Richmond, Iowa.

I claim a furnace of fireplace lining for steam boilers formed of clay, substantially in the manner herein shown and described.

76,443.—COMPOSITION FOR COVERING WOODEN BRIDGES, Buildings, etc.—Joseph Heckel and Michael Eicheinger, Decatur, Ill.

We claim the composition above described when compounded and used as and for the purposes specified.

76,444.—BASKET GRATE FOR FURNACES.—J. J. Heindl, New York city.

I claim the basket grate, C, having its sides, a a, constructed of inclined plates, partially or wholly closed, substantially as described.

76,445.—MODE OF PRESERVING GUNPOWDER.—E. E. Hendrick, Carbondale, Pa.

I claim the application, substantially as described, of any substance possessing the necessary hygroscopic properties, to the preservation of gunpowder, or other like substances, from injury by dampness.

76,446.—PORTABLE HEAD REST FOR CAR SEAT.—R. W. Heywood, Baltimore, Md.

I claim the combination of the regulating screw, D, with the hinged adjustable standard, B, which supports the head rest, and the clamp, A, and straps, G G, by which the apparatus is attached to the back of a car seat, when the parts are constructed and combined so as to operate together, substantially as and for the purpose specified.

76,447.—GANG PLOW.—W. F. Higgins and Jerome Perry Watsonville, Cal.

We claim, 1st, The combination of the inclined beams, I and K, braces or supporting bars, J and L, adjustable pivoted bar, M, and pivoted bars, H, with each other, with the plow frame F, sulky or wagon frame, A, and axle, B, substantially as herein shown and described, and for the purpose set forth.

2d, The combination of the lever, P, connecting bar, O, and arm, N, with the axle, B, and framework of the sulky or wagon, substantially as herein shown and described, and for the purpose forth.

76,448.—STEAM ENGINE PISTON.—J. Hinds, Salem, and G. H. Lodge, Swampscott, Mass.

We claim, 1st, In combination with an expansible cylindrical piston, as described, the detachable head, B', with elongated bolt holes, as described, or their equivalents, and connecting rod jointed to said piston head, substantially as set forth.

2d, In combination with the piston head and connecting rod, the tubular nut, C, lining plate, e, and eye bolt, d, screwing into the nut, C, and all arranged substantially as described.

76,449.—HORSESHOE.—Warner Hinds, Worcester, Mass.

I claim the horseshoe, complete in one piece, formed by the combination of the sole, A, with or without calks, the arms, B B, and clinches, I I, when constructed and operating in the manner and for the purposes above set forth and described.

76,450.—LAMP BURNER.—R. Hoadley and H. A. Shipman, Ansonia, Conn.

We claim the perforated plate, D, in combination with the deflector, H, and the base, B, when the said plate is arranged in the manner described, and constructed in one and the same piece with the vertical springs, E, and the chimney supporters, F, substantially as set forth.

76,451.—MACHINE FOR PICKING HAIR.—Ernst Hoffstaetter, New York city.

I claim the arrangement of the toothed cylinder, C, corrugated feeder, E and removable picker, D, with the hinged feed box, B, when the latter is provided with the springs, d h, whereby the hair is fed, either between the feeder, E, and picker, D, to the cylinder, C, or upon one side of the feeder, E, to the cylinder, without coming in contact with the picker, D, all constructed and operating as herein described, for the purpose specified.

76,452.—FANNING CHAIR.—A. R. Hobbs and N. F. Wright, Elizabethport, N. J.

We claim, 1st, A rocking chair, operating the fans, G, substantially as shown and described and for the purposes set forth.

2d, The back, B, and seat, C, in combination with the arms, D, and rock shaft, a, and spring, S, and frame, A, substantially as shown and described and for the purposes set forth.

3d, The arms, D, in combination with the notches, e, and pins, e', and seat, C, substantially as shown and described, and for the purposes set forth.

4th, The curved rack, D', and frame, A, in combination with the pinion, F, and shaft, E, and fans, G, and the seat, C, substantially as shown and described, and for the purposes set forth.

76,453.—SKATE.—James Holland, Brooklyn, N. Y.

I claim, 1st, The lever, e, and movable dog, h, in combination with the movable fulcrum, f, substantially as described.

2d, The movable dog, h, and movable fulcrum plate, f, in combination with the slot, c, substantially as shown.

3d, The ridge, i, on the lever, e, arranged substantially as shown, to draw the fulcrum plate down on the foot plate, substantially as described.

4th, The combination, substantially as described, of the lever, c, the movable dog, h, and trap, o.

5th, The arms, p, arranged on screw or fulcrum pin, m, for the purpose of raising the plate, f, free from contact with the foot plate, substantially as described.

76,454.—PEN.—J. H. Holland, Hancock, Mich.

I claim, 1st, The barrel, B, formed with holding lips, b', on the outside of its back, when provided with a projecting guide plate, C, adapted to receive the holder, D, which is adjusted by means of the screw, E, passing through a lug, d', attached to the holder, D, said screw being swivelled in the fixed projection, c', all constructed and operating as described for the purpose specified.

2d, In combination with the holders, B D, having lips, b', the pens, F G, when their lower ends are turned up, as described for the purpose set forth.

76,455.—COAL STOVE.—Elihu Hosford, Chicago, Ill.

I claim the grate, B, or its equivalent, for the purpose and substantiatry as herein described.

Also, the combination of the cylinder, A, grate, B, ash box, E, air space, H, columns, F F, and hot-air chamber, G, for the purpose and substantially as herein set forth.

76,456.—HORSE COLLAR.—Ira Houghtling, Houghton, Mich.

I claim constructing a horse collar, perforated and lined with leather, as described.

76,457.—COPYING PRESS.—T. P. Howe, Brooklyn, N. Y.

I claim, as an article of manufacture, the improved copying press, hereinbefore described, made by combining the rigid cylinder, A, the elastic tubing B, and the blanket or cloth, C, substantially as hereinbefore set forth.

76,458.—PHOTOGRAPHIC TRANSFER.—Orrin P. Howe, Augusta, Me.

I claim removing from the iron plate its japanned or enamel surface containing the picture, using for that purpose strong alcohol or chloroform, or any other article equivalent thereto, and mounting the same upon cards in the manner and for the purpose set forth.

76,459.—BENCH OR TABLE.—L. D. Hubbard, Worcester, Mass.

I claim a wash bench or table in which the cross pieces, B, hinged legs, C, removable extending arm, E, and hook and eye, or equivalent means for holding the said legs in a folding position, are combined and arranged relatively to each other in the manner and for the purposes herein shown and specified.

76,460.—DIE FOR FORMING LETTERS AND FIGURES ON THE Edges of Type Block.—T. S. Hudson, East Cambridge, Mass.

I claim the combination of the sectional dies, b b b b, and block, A, spindle c, screw nut, D, and compresser or piston, E, and lever, L, the whole constructed and arranged substantially as and for the purpose set forth.

76,461.—ORE CRUSHER AND GRINDER.—Seymour Hughes, San Francisco, Cal.

I claim, 1st, An ore crusher, having the spiral inclined planes, B B, together with the stamps, N, and dies, E, the whole constructed and operating substantially as and for the purpose herein described.

2d, In a circular crusher and grinder, the inclined planes, consisting of the removable grinding plates, b, and the adjusting plates, a a a, substantially as and for the purpose described.

76,462.—LAMP SHADE.—S. W. Huntington, Augusta, Me.

I claim, as a new article of manufacture, a lamp shade composed of a sheet of wood or veneer, with a backing of mica, the two sheets being held together, as herein described, with or without an interposed layer of paper between them.

76,463.—MODE OF OBTAINING HEAT.—J. Johnson, Saco, Me.

I claim the application and use of a small but proper quantity of any liquid or solid, when inclosed within an air-tight case or form, for the purpose of receiving heat sufficient to convert it to steam or vapor, and in this state to act as a conveyer and transmitter of heat to other bodies for needed changes and by which transference the agent shall reform to liquid, to be again and again converted to vapor, carrying with it latent heat for the transmission.

76,464.—CORN HUSKER.—L. H. Johnson (assignor to himself and Chauncey Johnson), Branford, Conn.

I claim the herein-described corn husker, consisting of the hook, A, upon the handle, B, provided with the rests, C and D, substantially as herein described, as a new article of manufacture.

76,465.—STILT SKATE.—Wm. Jordan, Galena, Ill.

I claim, 1st, A skate, having the runner and foot piece united by a jointed connection, substantially as and for the purpose specified.

2d, The combination of the runner, a, supports, b and d, and foot piece, c substantially as and for the purpose described.

3d, The combination of the runner, a, supports, b and d, foot-piece, c, and vertical extensions, b' b', of supports, b, and strap, f, as described.

76,466.—DRAFT EQUALIZER FOR DOUBLETREE.—R. F. Judson, Kalamazoo, Mich.

I claim the combination of the staychains, or wood or leather braces, the curved levers, crossing each other, and united by a bolt, forming a joint, the iron clevis, with hooks on each side, and near each end of the same, the staple in the clevis, the kingbolt, the staple, attaching rear end of clevis to the wagon pole, the small whiffletree, with the wagon pole, for the purposes set forth and described.

76,467.—MACHINE FOR BORING WAGON HUBS.—J. T. Kendall, Concord, N.H.

I claim, 1st, The guide, h', in combination with the gage arms, e and e', the

© 1868 SCIENTIFIC AMERICAN, INC.

set screws, f and f', the metallic frame-work, c', and the spring, g, substantially as described.

2d, The revolving table, k, with the arms or levers, p p p, and chucks, r, and ratchet wheel, n, and clamp, s'', combined and operated as described.

76,468.—RETAINER FOR NECK TIE.—W. J. Ketcham, Washington, D. C., assignor to himself and G. S. Prindle, Aurora, Ill.

I claim the within-described retainer for neck ties, consisting of the spring base or plate, A, and catches, B B, the latter provided with slots, D, and its ends meeting or overlapping each other, the whole arranged substantially as shown and described.

76,469.—SAWING MACHINE.—S. L. King, Lancaster, Pa.

I claim the construction of the rock shaft, J, with its adjustable screws, M, and regulating lever, N, as herein described, and for the purposes set forth.

76,470.—BRACELET.—C. M. Kinsel, Columbus, Ga.

I claim a bracelet so constructed as to be adjusted for wear as a finger ring substantially as described.

76,471.—SAW MILL.—J. L. Knowlton, Philadelphia, Pa.

I claim, 1st, The guides, F, slides, G, connecting links, i' i', pivoted levers, I I, and connecting rod, J, in combination with saw, H, all arranged and operating as described, for the purpose specified.

2d, The construction and arrangement of the segments, C D, the former having the opening, a x, for the purpose, substantially as described.

3d, The rack, l, and pinion, K, in combination with the sleeve, N, yoke, M, and feed rollers, J x, as herein described, for the purpose specified.

76,472.—STEREOSCOPE.—W. M. Kohl, Cincinnati, Ohio.

I claim, 1st, The combination of the bent rod, j, screw, m, and pivoted levers, O O', with the plate, L, and lense tubes, J, all constructed, arranged, and operating substantially as described for the purpose set forth.

2d, In combination with the above, the right and left-hand screw, P, having head, o, and passing through lugs, n, attached to sockets, K K, as described for the purpose specified.

3d, The spring clamps, g, attached to the bars, G, of the picture holder, and constructed in the manner substantially as and for the purpose specified.

76,473.—MACHINE FOR ATTACHING SPANGLES TO HOOPS OF SKIRTS.—A. Komp, New York city.

I claim, 1st, Providing the edge of the rib, b, of the spangle guide with one or more projections, c, substantially as and for the purpose set forth.

2d, The arrangent of indentations or ridges, d, in the floor, a, of the spangle guide, substantially as and for the purpose described.

3d, The slotted rod, x, and pin, v, in combination with the slide, q, which carries the spring jaw, h, of the spangle carrier, substantially as and for the purpose described.

4th, The latch, y, in combination with the movable jaw, h, of the spangle carrier, substantially as and for the purpose set forth.

5th, The curved slot, m, stud, l, pin, o, and standard, p, in combination with the arm, k, and with the spangle carrier, substantially as and for the purpose described.

6th, The stops, c' d', to retain the spangle carrier at the extreme ends of its stroke, substantially as set forth.

7th, The secondary arm, k*, and spring, e', in combination with the main arm, k, of the lever, L, and with the hammer, H, and spangle carrier, D, substantially as and for the purposes described.

76,474.—MANUFACTURE OF TIN BOXES.—J. D. Lane, N. Y. city, assignor to Horace Everett, Philadelphia, Pa.

I claim the lower portion of a blacking box, having a flange turned up from and forming a part of the bottom, and that flange rolled and indented, all as described for the purpose specified.

76,475.—FENCE.—Chas. Lee, Sandy Postoffice, Ohio.

I have the uprights, b b, horizontal bars, a a', braces, J J, and pins, f', when arranged and combined with the panels, as set forth.

76,476.—HAIR CLOTH.—Isaac Lindsley, Pawtucket, R. I.

I claim the method herein described of uniting woven fabrics having a face of hair with an imperceptible joint, by stitching the fabric through where it is to be united, and while the hair face is in a semi plastic condition produced by saturation, flattening out and pressing, with protracted pressure, this sewn joint between metal or like surfaces while subjected to a suitable degree of heat to mold and set the hair face at the joint permanently, so as to produce an unyielding joint a d an unbroken hair face at the joint, substantially as specified.

Also, as a new manufacture, a continuous web of hair cloth composed of two or more narrow webs, such as are usually woven from short hair weft, united after the sewing, moistening, and pressing process herein described, and in which a portion of the warp threads are removed before pressing, and the bights in the weft hairs of the united joint are bent and molded at right angles to the face of the fabric, and into or against each other, to conceal the joint, substantially as specified.

76,477.—ATTACHMENT FOR HEADS OF RAKES.—T. D. Little, Salisbury, N. H.

I claim the adjustable attachment for heads of drag rakes cumposed of the socket, a, brace, d, bolt and nut, b, and thumb screws, e, combined, constructed, and applied as above described.

76,478.—HAY PRESS.—G. W. Lockhart, Charlestown, Ind.

I claim the levers, H H, pivoted to the follower, G, when provided with the fulcrum rollers, a a, at about the center of their lengths, adapted to travel upon the horizontal platform, c, while their lower ends bearing the pulleys, c, are below said platform, all operating as described, for the purpose specified.

76,479.—PAPER DAMPENER.—J. A. Lynch, Boston, Mass.

I claim the combination of the filling tunnel with the cylinder and its cover by means of the link or arm, d, hinged to them, and so as to operate therewith, substa tially as described.

Also, the arrangement of the stand with the cover and the cylinder, in manner as described and represented.

Also, the combination of the filing tunnel with the cylinder and its cover.

76,480.—HORSE RAKE.—Milton Alden, Auburn, N. Y.

I claim the keys, B, in combination with the tooth, C, and the holder, A, as set forth for the purposes described, whether used transversely, longitudinally, or otherwise, for said purposes.

76,481.—WASHBOARD.—F. E. Maberry, Haverhill, Mass.

I claim the soap reservoir, as above described, with the valve, H, and spring f, in combination with a corrugated washboard with openings, c, when arranged substantially in the manner and for the purpose specified.

76,482.—LAMP BURNER.—J. J. Marcy, West Meriden, Conn.

I claim the combination and arrangement of the straight rod, f, with the cone, C, and cap, A, when the said straight rod, f, is hinged directly or indirectly to the cone, substantially as and for the purpose specified.

76,483.—OIL CAN.—J. J. Marcy (assignor to E. Miller & Co.), West Meriden, Conn.

I claim the thimble, C, with its nozzle, D, arranged upon the spout, B, so as to turn thereon, and operate in the manner described, in combination with the vent valve, h, in the cover or can, all constructed so as to operate in the manner described.

76,484.—CHURN DASHER.—Mary E. J. Marr, Jefferson, La.

I claim the combination of a revolving dasher, as herein described, consisting of the spindle, A, and arms, C, provided with apertures or perforations, a, in combination with the removable socket block, B, when provided with wooden screws, b, or their equivalents, when each and all the connected parts are of wood, and are constructed, arranged, and operate substantially as and for the purposes herein set forth.

76,485.—WELL TUBE.—Wm. Martin, Tarr Farm, Pa.

I claim the point, A, having the socket, S, the ears, E E, and the broad shoulders, a a, in combination with the tube, B, having the longitudinal slots i i, and with the rivets, r r, operating in the slots, i i, substantially as and for the purpose described.

76,486.—GRAIN-SCOURING APPARATUS.—P. H. Massey, South Bend, Ind.

I claim, 1st, The combination of the hopper, H, shaft, h, provided with the scouring disks, n, spout, E, chamber, C, with the inclined partition, b, and fan, B, when said parts are constructed and arranged for joint operation, substantially as described.

2d, The use, in apparatus, constructed substantially as described, of the detachable inclined bottom, i, and the removable tubes, v and v', for the purpose as herein described.

76,487.—DORY-BOAT KNEE.—E. G. Matthews, Boothbay, Me.

I claim a dory boat knee in which the wooden parts, A A, are combined with the metal supporting plates, B B, provided with the flanges and guards c c e, under the arrangement and for operation as herein shown and specified.

76,488.—LEAD AND SLATEPENCIL CASE.—T. B. McCaughan, Moscow, Tenn.

I claim the combination of the case, A, ferrule, C, and rod, E, attached to the sliding band, D, all arranged substantially as and for the purpose specified.

76,489.—FISH TRAP.—T. B. McCaughan, Moscow, Tenn.

I claim the loaded or weighted lever, D, at the upper end of the upright, A, in connection with the horizontal pole, B, line, E, and the bent rod, g, and pin, f, or their equivalents, all arranged substantially as and for the purpose herein set forth.

76,490.—TOOL FOR OPENING CANS.—M. T. McCormick, Meadville, Pa.

I claim the shaft, B, in combination with the arm, G, the knife, H, and the set screws, D D, when the same constructed in the aforesaid combination, for the purposes set forth.

76,491.—TENON FOR BLIND SLATS.—Wm. McFarland, N. Y. city, assignor to himself and John H. Campbell.

I claim the tenon, C, constructed with a beveled shoulder, E, and fastening plate, D, substantially as and for the purposes set forth.

76,492.—APPARATUS FOR ASSORTING COIN.—J. W. Meaker, Chicago, Ill.

I claim, 1st, The assorter, B, with an open front, and provided on its interior rear side with the guides, g and h, forming an inclined way, constructed and arranged for use, substantially as shown and described.

2d, Operating the follower, b, by means of a spring, C, applied externally, substantially as described, and for the purposes set forth.

3d, The slide, E, provided with the end piece, k, and pawl, m, constructed and arranged to operate substantially as described and for the purposes set forth.

4th, Providing the slides, E, with springs, so that one or more of the slides may be operated automatically at the same time, substantially as described, and for the purpose set forth.

76,493.—APPARATUS FOR ASSORTING COIN.—J. W. Meaker, Chicago, Ill.

I claim, 1st, The drawer, B, with the tube, I, having flanges, e, in combination with the arm, B, spring, d, and follower, a, constructed and arranged to operate substantially as described and for the purpose set forth.

2d, The stationary post, E, in combination with the sliding tube, C, with flanges, e, slot, o, and register, constructed and arranged to operate substantially as described and for the purpose set forth.

3d, The form, F, in combination with the sliding cover, g, constructed substantially as described and for the purpose set forth.

4th, In a coin assorter, an inclined way G, having the sides of the openings, j, forming the angle, l, inclined so as to deliver the coin below the upper line of the next opening, substantially as described.

5th, In a coin assorter an inclined way, C, having the openings, j, so arranged that the gravity of the coin will tilt them, and provided with a slit or lip, q, bent upward, for the coin to run under, and secure their tilting and delivery, substantially as described.

76,494.—CAR COUPLING.—John W. Melcher, Oshkosh, Wis.

I claim the disk, c, in combination with the groove, g, guides, d d, and springs, S S, in connection with the pin, e, draw head, a, and link, f, when arranged and constructed substantially as described.

76,495.—APPARATUS FOR FILTERING SUGAR.—Wm. H. Merrick, Philadelphia, Pa.

I claim the nipple, B, constructed substantially as described, for adaptation to an opening in the partition, A, large enough to admit of the passage thro' of the bag attached to the nipple, all substantially as and for the purpose herein set forth.

76,496.—CARRIAGE POLE.—V. N. Mitchell, Concord, N. C.

I claim the improved carriage pole, formed of two pieces of timber, a a, firmly secured together at the front end, and spread and curved downward at the hind ends, to prevent said pole from coming in contact with the elliptic springs, C, when the vehicle is turned, as herein shown and described.

76,497.—CHURNING APPARATUS.—E. J. Moore, Westfield, N. Y.

I claim, 1st, The combination of the bars, G and H, adjustable lever, D, and adjustable dasher handle, B, with each other, substantially in the manner as shown and described and for the purpose set forth.

2d, The combination of the adjustable balance weight, I, with the lever, D, substantially as herein shown and described, and for the purposes set forth.

3d, The combination of the weighted lever, J, or its equivalent, with the bars, H, or forward part of the lever, D, substantially as shown and described and for the purpose set forth.

76,498.—SLEIGH RUNNERS AND MODE OF ATTACHING THEM TO THE AXLES OF VEHICLES.—J. C. Moore, Madison, Ind.

I claim, 1st, The forked standards, D D, with the eyes, a a, in their upper ends, when used for the purpose and in the manner as specified.

2d, The step, C, when used in combination with the runner, A, for the purpose and in the manner as set forth.

76,499.—MANUFACTURE OF NITRO-GLYCERIN.—George M. Mowbray, Titusville, Pa.

I claim the process of manufacturing nitro-glycerin by the use of compressed air, artificially dried and cooled nitric acid, sulphuric acid and glycerin, substantially as described.

76,500.—MODE OF LOCKING NUTS.—Wm. Mullins, Pittsburg, Pa.

I claim the improved device for locking nuts, consisting of a metallic pin placed under the nut, in a groove in the surface against which the nut is screwed, and turned up so as to embrace the nut, substantially as hereinbefore described.

76,501.—HORSESHOE.—Patrick Murray, East Morrisania, N. Y.

I claim a steel horseshoe with two continuous or nearly so calks, 1 and 2, the former more prominent or projecting and with more bearing surface than the latter, so as to take the main support and wear while the latter continues sharp and efficient as an auxillary calk to prevent slipping, substantially in the manner described.

76,502.—PASSENGER REGISTER.—A. F. Nagle, Providence, R. I.

I claim the step, A, in combination with the paw l, G G, the ratchet wheel, G, the shaft, F, the cog wheel, H, the rollers, I I I, and the band, K K, or their separate equivalents, arranged substantially as described and for the purpose specified.

76,503.—HOSE COUPLING.—Peter H. Niles, Boston, Mass.

I claim, 1st, A segment nut in combination with the perforated hose, substantially as described.

2d, A segment nut and the perforated hose in position, in combination with the shank of the coupling, in the manner and for the purpose substantially as described.

76,504.—BRICK MACHINE.—Clinton Nolan, Niles, Mich.

I claim the combination of the parallel hinged arms, E, pivoted nuts, D, straps, H, weighted lever, I, and stands, S, with the shaft, B, arranged substantially as described for the purpose specified.

76,505.—COMBINED CLAY GRINDING AND SEPARATING MILL.—F. B. Norton and F. Hancock, Worcester, Mass.

We claim, 1st, The combinaton with a perforated potters' clay grinding cylinder of a separating sieve and sieve holder, substantially as and for the purposes set forth.

2d, The combination, with the perforated clay grinding cylinder, B, separating sieve, b, and sieve holder, C, of the rotary grinding arms, E, provided with one or more lips, e, substantially as and for the purposes set forth.

76,506.—HAY ELEVATING APPARATUS.—Joseph F. Nugent, Cannonsburg, Mich.

I claim, 1st, The stop, e, of the draft rope, C, in combination with the carriage, B, and the track, A, operating substantially as and for the purpose specified,

2d, The arrangement of the three pulleys with their accompanying pawls and ratchets upon the carriage, B, and in relation with the draft rope, substantially as and for the purpose specified.

3d, The combination of the lever arm, n, crank arms, n' n*, connecting rod F, and studs, s, with the pawls and ratchets of the pulley, a b c, of the carriage, B, substantially as and for the purpose specified.

76,507.—HARNESS.—Robert O'Brien, Towlesville, N. Y.

I claim the combination of the bridle, C, plates, D and G, hames straps, O, bars, Q, and saddle, R, with the looped pintles, E K T, and straps, I Z, arranged and operating as herein described for the purpose specified.

76,508.—KILN FOR DRYING MALT.—Christian Oefinger and Seba tian Grupp (assignors to themselves and Henry Stempleman), San Francisco, Cal.

We claim the openings, D D, for the passage of cold air to the chambers, C, in which the hot and cold air are combined, and the pipes, E E E, provided with caps or valves, E', for conveying it to different parts of the perforated plate, the whole constructed and arranged substantially as and for the purpose specified.

76,509.—VITRIFIED COMPOUND.—James O'Friel, Blair County, Pa. Antedated March 28, 1868.

I claim the composition herein described, prepared in the manner set forth.

76,510.—MACHINERY FOR THE MANUFACTURE OF GUNPOWDER.—Paul A. Oliver, New York city.

I claim a machine for crushing, grinding and incorporating together the ingredients for the manufacture of gunpowder, composed of a series of rollers placed in pairs, one pair above another, and a lower pair one or more of toothed rollers, all arranged to operate substantially as shown and described.

76,511.—HORSE HAY FORK.—James O'Rouke, Columbiana, Ohio.

I claim handle, g, lever, h, and bar, C, combined and operated as and for the purpose specified.

76,512.—TATTING SHUTTLE.—E. N. Parker, Essex Center Brook Post Office, Conn.

I claim as a new article of manufacture a tatting shuttle having its sides enclosing the revolving tube, c, and spool, d, and its perforated ends riveted together and to the blocks having the tension holes, g h, all constructed as herein shown and described.

76,513.—STRAW CARRIER.—Wm. Parker, Washington, O.

I claim, 1st, A series of open or riddle like bars, substantially as and for the purpose set forth.

2d, A series of bars, operated with one crank shaft only, substantially as and for the purpose set forth.

3d, A series of bars curved substantially as and for the purpose set forth.

4th, A series of bars provided with horns, substantially as and for the purpose set forth.

76,514.—COFFEE POT.—James Willard Patterson and Joseph Stackey Hill, Cincinnati, Ohio.

We claim the combination of the vessels, A and B, and coil, E, when so arranged that the pipe may be made to discharge into either vessel at will, substantially as and for the purpose set forth.

76,515.—FENCE POST.—Garrett R. Patton, Juda, Wis.

I claim a metallic base or support for posts, consisting of the socket, B, spreading legs, C, and cross bars, D, arranged and constructed substantially as herein described.

76,516.—ROOF STAGING.—Chester M. Pease, Monson, Mass.

I claim the plank, A, provided with the claw, C, hold fast, D, and rack, B, in combination with the bar, E, connected to A by a joint, f, and leaving a support, F, attached to it by a joint, g, the lower end of F being provided with a forked plate, G, to catch into the rack, and arranged in the manner as and for the purpose set forth.

76,517.—CONNECTING LINK.—Wm. N. Pelton, New London, Conn.

I claim a connecting link, consisting of the body, A, and of the bar, B, pivoted to the same, all made and operating substantially as described, for the purpose specified.

76,518.—HORSERAKE.—Charles B. Perkins, Kenduskeag, assignor to himself and Barnabas Burseley, Sangerville, Me.

I claim lever, G, knees, L, friction roller, K, and lifting roller, H, construted, combined and arranged substantially as described.

76,519.—WRENCH.—A. S. Petrie, Hudson City, N. J.

I claim the obliquely grooved or ribbed sliding key, C, in combination with the movable jaw, B, and the obliquely grooved or ribbed shank, A, substantially as and for the purpose specified.

76,520.—CAR REPLACER.—Nathaniel Pullman, New Oregon, Iowa.

I claim, 1st, The shoe, B, constructed in two parts, with parallel and diverging slide, and having clamps, b3, and bolt, b, substantially as described.

2d, The shoe, C, constructed with parallel and diverging sides, the outer of which is higher than the inner, as and for the purpose described.

3d, The combination of shoes, B C, rails, D D', E, when constructed as described, adapted to the rails, A A, and operated substantially as set forth.

76,521.—ELECTRO-MAGNETIC LOG.—W. I. Reid, Brooklyn, N. Y.

I claim the log, provided with a break for closing and breaking the electric circuit, substantially as described, in combination with the registering instrument connected therewith by an electric conductor, the said registering instrument being provided with an escapement operated by an electro-magnet, and with the means described, or equivalent means, for registering, all substantially as specified and for the purpose set forth.

76,522.—HARVESTER.—Stephen Rex, Orefield, Pa.

I claim the locking pawl, e, lifting lever, a, and spring, f, substantially as shown and described, when combined with any toothed wheel of the gearing, operating the cutters or knives of a reaping or mowing machine, all as and for the purpose set forth.

76,523.—PLATFORM SCALE FOR WEIGHING.—Wm. W. Reynolds (assignor to Howe Scale Co.), Brandon, Vt.

I claim the combination of the two-yoke levers and their wheels and caster, or the equivalent of the latter, with the platform scale, the whole being arranged and to operate substantially as described.

76,524.—WAGON WHEEL.—Paris Richardson, Jr., Warren County, Ill.

I claim a wagon wheel having a felloe, B, case of one piece of metal, and a hub composed of the metal part, F, and cap, D, with grooves, h, and wedge spindle, G, all connected and arranged substantially as and for the purposes set forth.

76,525.—ROTARY STEAM ENGINE.—Matthias Rikert, Oneida, Ill.

I claim the arrangement of the stop or partition block, O, pistons, E E E, trams, G C, and cams, H H, and standards, I I, substantially in the manner and for the purpose as herein shown and described.

76,526.—VALVE ROD CONNECTION.—John Robertson, Quincy, Ill.

I claim the sleeve nut, B, arranged substantially as shown, whereby a valve rod or connecting rod may be adjusted without turning the same, substantially as described.

76,527.—FIRE ESCAPE.—Azariah Robinson, New York city.

I claim the arrangement of the chair, C, with relation to the rope, B, and crane, A, whereby the chair, by its hook, d, is adapted to be kept free from contact with the flames escaping through the lower windows of a burning building, as herein described for the purpose specified.

76,528.—BALANCED SLIDE VALVE.—William B. Robinson, Detroit, Mich.

I claim the balanced slide valve, constructed as described, having the perforated side recesses, B, adapted to receive the single packing strip, C, having in different surfaces, forming recesses, the inner recess communicating with the interior of the valve through the openings, c, and the ends of said valve having perforated recesses, D, containing the double packing strips, the inner one, F, of which is formed in one piece, and the outer one, E, of two pieces, held apart by the spiral spring, the recesses in this ring, F, also communicating with the interior of the valve through the openings, e, all constructed, arranged and operating as herein described, for the purpose specified.

76,529.—GRAIN CONVEYER.—J. M. Rush, Marengo, Iowa.

I claim the sliding frame combined with the disk, d, and the flights, a a, on the shaft, B, arranged and operating substantially as and for the purpose herein described.

76,530.—SAP SPOUT.—J. B. Sargent, New Haven, Conn.

I claim, 1st, A sap spout, constructed with the hollow screw shank, B, having formed in the shank, between the screw and the base of the spout, the chamber, C C, in the manner and for the purpose set forth.

2d, A sap spout provided with the packing, a, around the shank, in the manner and for the purpose substantially as herein set forth.

76,531.—SHAFT COUPLING.—Anson Searls, New York city.

I claim, 1st, A shaft hook made eccentric in form, with a bolt hole through it, and the recess, B, in the front side, as shown.

2d, An eccentric cap, C, with the recess, D, for the purposes set forth.

3d, The cap, C, spring, E, cap, H, nut, F, and bolt, I, in combination, and in combination with the hook, A, and pin, K, substantially as described and for the purposes set forth.

76,532.—FRUIT DRYER.—M. A. Shepard, Bridgeport, Ill.

I claim the furnace, B, when constructed as described, and hot air chamber, D', arranged as described, in combination with the safe, A, the whole being so constructed that the two latter can be readily detached from the furnace when desired, and used for other purpores, as set forth.

76,533.—SPOOL STAND.—Jos. H. Simmonds, Philadelphia, Pa.

I claim, 1st, The combination of the body, D, spool spindles, F, arms, C, and support, A B, substantially as described, for the purpose specified.

2d, The spring, C, supporting the closed body, A, when constructed and operating substantially as desbribed and for the purpose specified.

76,534.—STEAM HEATER.—Wm. Simpson, Rosherville, and Wm. Howitt, Notting Hill, England.

We claim constructing arched or curved frames for the roofs of horticultural and other buildings, wholly or in part of metallic tubes, D, united by curved sockets, E E', and so connected and arranged as to permit and facilitate a circulation of hot water through the same, all substantially in the manner and for the purpose herein set forth.

76,535.—APPARATUS FOR GENERATING GAS.—William M. Sloan, Buffalo, N. Y., assignor to Car Carpenter.

I claim the combination of the carbureting apparatus, A B D, when constructed and operating as described, with the fire chamber, I, cylindrical retorts, L L1 L2, etc., etc., and pipe, E, when the parts last mentioned are arranged in the manner set sorth, the whole operating together substantially as and for the purpose specified.

76,536.—WRENCH.—E. A. Smead, Tioga, Pa.

I claim the cam, e, for holding the sliding jaw, C, as herein specified.

76,537.—IMPLEMENT FOR CUTTING, PERFORATING, AND LIGHTING CIGARS.—Charles F. Smith, Springfield, Mass.

I claim as a new article of manufacture the stand, B, with match box, C, burner, A, and cutting device, D I d, the whole constructed and arranged substantially as and for the purposes set forth.

76,538.—AMALGAMATOR.—Robert Smith and Wm. T. Smith, Carondelet, Mo.

We claim, 1st, The amalgamating troughs, B B', when their bottoms are serrated, and acute angles, b', formed at the back end of each serration, as described and set forth.

2d, The combination of two or more sets of amalgamating troughs, B B', with the delivery flume, C, and distributing aprons, D E, substantially in the manner and for the purpose herein shown and described.

3d, The swivel guide blocks, c and d, when applied to the flume, C, and apron, D, as described and set forth.

4th, The arrangement of the shafts, I, with their handles, i, and levers or arms, i', when employed as herein described and shown.

76,539.—LEMON SQUEEZER.—Thos. C. Smith, N. Y. City.

I claim, 1st, Providing the interior of the cup, B, with a shoulder, a, to receive a ring, f, of india rubber, or other suitable elastic material, on which the flange, e, of the concave, G, rests or bears, in connection with the lips, g g, at the upper part of the cup, B, and the noteh, h, in the flange, e, of the concave, all arranged substantially as shown and described, for the purpose of securing and packing the concave in the cup.

2d, The combination of the cast-metal handles, A A', plate, E, and cup, B, with the porcelain compress, F, and concave, G, the two cast-metal parts being connected by a hinge or joint, and the porcelain parts attached to the cast-metal parts, substantially as shown, for the purpose set forth.

76,540.—BRICK FOR BUILDING PURPOSES.—Wright Smith, St. Louis, Mo.

I claim the brick, A, when provided with the dove-tailed mortar cavities, a, extending across a portion only of the depth of the brick, the same being in shape flaring at the bottom and narrower at the top, substantially as and for the purpose described.

76,541.—MODE OF LUBRICATING AXLES.—Jacob L. Sorber, Chillicothe, Ohio.

I claim, 1st, The combination of the tubular spindle, B C, elevated oil reservoir, D, taps, E, ducts, F F', and annular oil chambers, J J', as and for the purposes specified.

2d, Providing the inner end of a wheel hub with the outwardly flaring sand and mud guard, I, for the purpose described.

3d, Attaching the bar or block, M, to the axle in the rear of the collar, a, for the object explained and set forth.

76,542.—DRAW BRIDGE.—Thos. S. Speakman, Camden, N. J.

I claim a bridge, constructed with the widened parts, D D, with the channel, C, between them, and having two connecting draws, G G', that span the channel, one at the upper and the other at the lower side of the bridge, substantially as and for the purpose specified.

76,543.—MACHINE FOR POLISHING THE HEELS OF BOOTS AND SHOES.—Vivian K. Spear, Lynn, Mass.

I claim, 1st, In combination with the boot-holding bracket, mounted on a sliding base plate, the lever, G, with ratchet, pawl, and connecting-rod, I, substantially as and for the purpose described.

2d, In combination with the sliding bracket, lever, G, connecting-rod, I, and ratchet and pawl, the forked lever, L, spring, l, and connecting-rod, j, substantially as and for the purpose set forth.

3d, In combination with the boot-holding bracket and polisher, as described, the clutch, R, with the central point, r, and flange, r', substantially as and for the purpose specified.

4th, In combination with the bracket and polisher, the attachable and detachable button, q, as and for the purpose described.

76,544.—COMPOSITION FOR PURIFYING ILLUMINATING GAS.—Wm. H. St. John and Peter Cartwright, New York City.

I claim the process of purifying illuminating gas, made from bituminous coals, by transmitting it through a composition of pulverized iron ore, strengthened to about eighty per cent of pure metal, moistened with ammoniacal liquor, and mixed with about five per cent of pulverized charcoal, and prepared as more fully set forth above.

76,545.—STEAM ENGINE SLIDE VALVE.—Jerome Stocking and Edward P. Shaffer, Rochester, N. Y.

We claim the combination of the fixed nut, g, screw-head, h, with the double-seated valves, E and F, whereby the seats of the valves are allowed to work freely, irrespective of expansion and contraction of the steam chest, substantially upon the principle as herein set forth.

76,546.—CARRIAGE BOLT.—James Strawn, Plymouth, Mich.

I claim the combination of the clip, c, with the bolt, d, the latter being loose in the former, as and for the purpose described.

76,547.—CLOTHES PIN.—A. L. Taylor, Springfield, Vt.

I claim the combination of the hook or fastening, B, with an ordinary clothes pin, A, when the fastening is constructed and applied to the outer side of the pin, substantially as herein shown and described.

76,548.—BALING PRESS.—Enoch Taylor, Memphis, Tenn.

I claim the arrangement of the upper platform, B, lower platform, N, working upon the posts, O, connecting-bars, M, toothed segments, L, worm, K, and the gearing, D E G H, and crank-wheel, J, all operating as described, for the purpose specified.

76,549.—MATCH STAND.—George G. Taylor, Charlestown, Mass.

I claim, as an article of manufacture, a safe for matches, containing the drawer, H H, and the movable pan, f f, with the two chambers formed therein, and either made of or lined with metal, together with an igniting surface, N N, on one side thereof, the whole constructed in the manner and for the purposes substantially as set forth.

76,550.—HORSE HAY FORK.—Truman H. Tears, Le Roy, Pa.

I claim the arms, A B, when constructed in the manner and for the purpose substantially as herein set forth.

Also, the combination of the arms, A and B, link, D, pulley, F, and pin, H for the purpose and substantially as herein described,

76,551.—MUSIC RACK.—George Tefft, Salem, N. Y.

I claim, 1st, An improved music rack or machine for turning music, constructed in the manner and for the purposes substantially as herein described and set forth.

2d, I claim the notched levers, C C' and CC'', and the cog-wheels, H H' and H'', and the cylinders, D D' and D'', in combination with and operating the leaves or folds, O, of a music rack or frame, substantially as hereinbefore fully described and set forth.

© 1868 SCIENTIFIC AMERICAN, INC.

3d, The upright or bar. B, and the cylinders, D D' and D", and levers, C C' and C", in combination with a music rack or frame, substantially as herein fully described and set forth.

4th The combination of the levers, C C' and C", operated by the springs, E E' and E", and F F' and F", with the cog-wheels, H H' and H", cylinders, D D' and D", and upright or bar, B, each being constructed and operated in the manner and for the purposes substantially as herein fully described and set forth.

76,552.—HYDROCARBON BURNER.—Frederic William Thayer, Boston, Mass.

I claim, 1st, The combination of one or more elongated projecting jet pipes with the evaporator or retort, when they are so proportioned to each other that, by means of the evaporation alone, the vapor will be discharged from said pipes with force, so as to produce an elongated jet of flame, similar to that of the blow pipe, substantially as described.

2d, The jet pipe, supplied with gas or vapor, as described, in combination with the adjustable mixing pipe or chimney, by which a current of air is drawn into the same, and mixed with the jets of vapor, substantially as described.

3d, Combining with the retort or evaporating vessel the air chamber, for heating the air supplied to the jets and protecting the vessel, substantially as described.

4th, So combining the chimney with the heating chamber and jet pipe that it is supported by the upper wall of the chamber in proper relation to the jet pipe, so as to receive from the chamber the proper amount of air to supply the jet, substantially as described.

5th, Adjusting the chimney and jet pipe by means of the nuts, a, in combination with the air chamber, substantially as described.

6th, The employment of two or more retorts, one over the other, and the heating of the uppermost retort by jets supplied by the retort beneath it, substantially as described.

76,553.—BEDSTEAD.—William L. Thomas, Middlebury, Ohio.

I claim the bedstead, constructed as described, and consisting of the side rails, B, strips, D, end rails, C, posts, A, slats, F, having pins, G, springs, E, hinged section, P H, also provided with spring slats, F F G, arms, I, straps, J, shaft, K, ratchet and pawl, M N, and crank, L, when said side rails, B, are provided on the inner face with guides for the ends of the spring slats, F, all arranged and operating as set forth.

76,554.—ATTACHMENT TO COOKING STOVES.—John Thornley, Fallston, Pa.

I claim, as an article of manufacture, a cast or sheet-iron drum box, so made as to form an extension of the top of a cook stove, and provided with shelves at the sides, a boiler hole on the top, and adjustable wing gates in the flue chamber, and connecting a cook stove flue with a chimney, substantially in the manner and for the purpose described.

76,555.—MEDICAL COMPOUND.—W. P. Thurber, Chicago, Ill.

I claim the improved medicine prepared of the material and substantially as herein set forth.

76,556.—CUTTER HEAD FOR WOOD PLANING MACHINES.—Thomas Tostevin, Council Bluffs, Iowa.

I claim the cutters, B, having an outwardly-projecting flange upon their rear edges, and the caps, C, provided with a series of parallel longitudinal grooves in their under sides, constructed to operate substantially as described.

76,557.—VOLUTE SPRINGS.—Joseph Trent, Millerton, N. Y.

I claim, 1st, As a new article of manufacture, the quadruple volute spring, constructed in the manner herein set forth.

2d, The improved method herein described of manufacturing double or quadruple volute springs.

76,558.—BRIDGE.—L. E. Truesdale, Chicago, Ill.

I claim, 1st, The construction and arrangement of the corrugated clamp plates, H, in combination with the tie rods, S", in the manner and for the purpose herein described.

2d, The construction and arrangement of the caps, A and A", and posts, B, of a bridge so that the suspension rods may be clamped together by means of the corrugations upon the ends of the same, and held firmly in position by means of clamp, E, and wedge or key, I, substantially in the manner and for the purpose herein described.

76,559.—RAILWAY SIGNAL AND ALARM.—A. C. Twining, New Haven, Conn.

I claim, in a railroad draw or other opening, the locking apparatus, constructed and operating substantially as described, when connected with the described devices for actuating the brake, bell or whistle, upon the engine of a moving train, all substantially as set forth.

In combination with the above also the handle, h, connected and arranged as described, to strike on the successive inclines, substantially as and for the purpose set forth.

76,560.—BRIDGE.—John B. Valliquette, Chicago, Ill.

I claim the gates, G G, arranged to run in slots, H H, in combination with the trucks, J J, projections, e e, and rubber blocks, X X, substantially as and for the purpose set forth.

76,561.—WINDMILL.—J. H. Van Nortwick, Sturgis, Mich.

I claim the combination and arrangement of wind wheel, m, wings, n n, pinions, s s, wheel, H, lever, E, spring, a, and plate, p, or its equivalent, substantially for the purpose described.

76,562.—CHAIN LINK.—Samuel Vanstone (assignor to himself and John Stewart), Providence, R. I.

I claim constructing the two divisions of a connecting link, in the manner substantially as described, for the purposes specified.

76,563.—LIME KILN.—Michael Verhoeven, Rochester, N. Y.

I claim the construction and arrangement of the furnaces with the removable grate bars, d, angular diffusing sides, g g g', lateral passages, C 1, and double arches, k k', with intervening air space, i, the whole operating in the manner and for the purpose herein set forth.

76,564.—STOVE DRUM.—Jacob Voegtle, Indianapolis, Ind.

I claim a heat regular, having cylinders, F E and D, damper, a, rings, B and H, and plates, C G and K, constructed, arranged and combined substantially as and for the purposes herein specified.

76,565.—COAL STOVE.—Felix Walker, Memphis, Tenn.

I claim the egg shaped stove, A, having an open bottom, the bed plate, B, and chamber, C, in combination with the semi-elliptical reflecting niche, F, all arranged as described for the purpose specified.

76,566.—SHINGLE MACHINE.—Wm. H. Walker, Fond du Lac, Wis.

I claim, 1st, The combination of the wheel, G, provided with the cam, m, and the sliding carriage, provided with the friction rollers, i, or equivalents, all constructed and arranged to operate substantially as described.

2d, Operating the dogs, p, by means of the inclined bar, b', sliding box, N, and lever, u, operated by cam, P, substantially as set forth.

3d, The forked lever, T, pivoted upon the main frame, A, and arranged to be operated by the carriage, L, for the purpose of raising the blocks from contact with the saw, substantially as described.

4th, Locating and carrying the tip tables, O, with their cam shafts, on the saw carriage, L, substantially as shown and described.

5th, The metal dogs, f', secured to the wooden head blocks, l', when arranged in the metal frames, D, as set forth.

76,567.—CLOCK ALARM.—C. H. Warner, New Haven, Conn.

I claim, 1st, The cam, F, and lever, G, with the dial, B, when the said cam is arranged to operate the lever, G, once only during two revolutions of the dial, B.

2d, The combination of the lever, G, and the hammer, X, with the lever, G, when arranged so that the hammer, X, operates the lever, g, in the manner and for the purpose described.

3d, The combination of the cam, U, and the cam or pins upon the shaft, a, with the lever, g, and its arm, h, arranged so as to operate in the manner described.

76,568.—CORPSE PRESERVING CASE.—Joseph S. Waterman, Roxbury, Mass.

I claim making the ice box, B, adjustable within the case, A, so that it can be raised or lowered to increase or diminish the size of the corpse chamber, for the purposes described.

76,569.—CHAIR SEAT.—G. A. Watson, Proctorsville, Vt.

I claim the securing of bottoms in chairs by having grooves, a, made in the upper surface of each rail, b, of the seat frame, and having strips, B, to fit in said grooves to clamp and firmly hold the edges of the bottom in the grooves, the strips being drawn into the grooves, and firmly secured in position by screws, d, or other means, substantially as set forth.

76,570.—SOFA BEDSTEAD.—Julius Werner, New York city.

I claim, 1st, The combination of the back, D, upholstered upon both sides and hinged at the base, with the seat, C, upholstered upon both sides and hinged at the front edge, and adapted to be folded out to give place to the back, D, when folded down, substantially as described and specified.

2d, In combination with the frames, C and D, arranged as above, the extension head and foot rests, E E, all made and operating substantially as herein shown and described.

3d, The frame, A, double cushioned seat, C, and folding back, D, and the extension head and foot rests, E, in combination with the covering cushions, F, as herein described, for the purpose specified.

76,571.—HARVESTER.—Cyrenus Wheeler, Jr., Auburn, N. Y.

I claim, 1st, The combination of the endless and continuously moving chain, as the machine advances, the rim, G, and its interior wheel, d, with ratchet, pawl, and spring bolt attachment, for the purpose of setting in motion and driving a rake, at the will of the operator, which rake is automatically thrown out of action at the completion of every sweeping operation substantially as described.

2d, In combination with a rising and falling and sweeping rake, the two pivots or centers of motion, i m, the latter being oblique to and in a different plane from the former, so that, as the rake drops upon the platform, it will cut or shear in under the reel, and fall more nearly to the cutting point, and thus reach all the straw, however short it may be, substantially as described.

3d, In combination with a rising and falling and sweeping rake, the armed lever, q, cam, s, and notches at or near the parts, n p, for the purpose of connecting and disconnecting the two parts, substantially as and for the purpose described.

4th, In combination with the endless chain for driving the reel, the swinging and adjustable arm, 6, with its pulleys, one in each end thereof, for taking up the slack of or letting out the chain, as the reel is lowered or raised on its post, substantially as described.

76,572.—TOP GAME BOARD.—David Wight, New London, Ct.

I claim a board or box constructed with compartments and provided with counters arranged to slide upon wires or rods, substantially as and for the purpose described.

76,573.—HORSE HAY FORK.—J. H. Wilder, Farmington, Ohio.

I claim the bail, D, having slotted end, a, in which the horizontal catch, c, is pivoted centrally, said catch notched at its forward end, and bold engaged with the upper end of the post B, by the rearward projecting spring attached to the rear end of the catch, c, and released by the rope, e, secured to the same end of the catch, and hanging downward through the head, A, all constructed and arranged to operate as herein shown and described.

76,574.—DIES FOR MAKING PLIERS.—Solomon H. Wood, East Berlin, Conn.

I claim the dies represented in figs. 5 and 7, constructed and used in the manner and for the purpose purpose substantially as set forth.

76,575.—SPRING BED BOTTOM.—Abram W. Wright, Bunker Hill, Ind.

I claim the spring, C, made substantially as described, viz., of the two helix coils, the junction loop, and the arms projecting from such coils, the whole being arranged as specified.

Also the pin, k, in the slat, in combination with the spring, C, made and applied to the slat, as specified.

Also the combination of the two supporting screws, e e, and loops, f f, with each spring, C, made and applied to the slat, as specified.

76,576.—CRIMPING MACHINE.—R. A. York, Reading, Mich.

I claim, 1st, The combination of the form, F, spring hinged extension blocks, G G, having grooves, K, hinged extension plates H, adjustable gripes I, adjustable draw block, L, having flanges, N N, and jaw, V, substantially as and for the purpose specified.

2d, The rubbers, A, constructed as described, in combination with the spring, D, substantially as and for the purpose specified.

3d, The rubbers, A, in combination with the slotted arm, 5, roller, 2, and form, T, as herein described, for the purpose specified.

4th, The combination of the rubbers, A, form, F, slotted and grooved V-shaped stock, F, straps, R, rollers, and treadle, substantially as described, for the purpose specified.

5th, The device for crimping leather constructed and combined to operate substantially in the manner and for the purpose described.

76,577.—EXTENSION CHAIR.—B. H. Zinn, New York city.

I claim, 1st, The links, a and b, and catch, d, substantially as shown and described, in combination with the parts, A and B, of an X-chair, all as and for the purpose set forth.

2d, The extension legs, L L K, ratchet legs, J J, and spring lever, h h, substantially as and for the purpose shown and described, in combination with the hinged foot rest, G H, and parts, A B, of an X-chair, all as set forth.

76,578.—CULTIVATOR AND HARROW.—Simon Conrad, Petaluma, Cal.

I claim, 1st, The connecting devices, by which I attach at pleasure the cultivator or the harrow alternately to the truck or carriage, all as shown and described.

2d, In combination with the above, the construction of the spindles on which the wheels of the truck are placed, so that they may be so placed on the axle as to increase or decrease the distance between the wheels, as may be desired, all as and for the purposes shown and described.

REISSUES.

2,910.—APPARATUS FOR SEPARATING SHOT.—Wm. A. Shaw, Gardner Willard, Lewis Colwell, and Joseph Colwell, assignees of Wm. A. Shaw, New York city. Patented Jan. 9, 1866.

We claim, 1st, In the process of manufacturing shot, the use of an automatic apparatus so constructed and operated as to separate the perfect from the imperfect shot, and so as to assort the different sizes of shot and deposit them in separate places or receptacles, substantially as described.

2d, Separating the perfect from the imperfect shot by the use of a series of inclined planes, so arranged and adjusted in respect to each other as to break one or more times the plane and direction of descent, and arrest in whole or in part the motion of the imperfect shot, for the purpose of changing its axis of motion, and thus gradually bring it to rest in receptacles at the foot of the various inclines, leaving the perfect shot only to descend to the bottom of the series of planes.

3d, A series of revolving screens, or assorting the shot, in combination with the inclines and receptacles, substantially as specified.

2,911.—HAY RAKER AND LOADER.—Horace Baker, Cortland, N. Y. Patented July, 3, 1866.

I claim, 1st, The two positively actuated endless aprons, revolving in opposite directions, in combination with the toothed wheels, R2, or their equivalents, upon the shafts, I and L, and so placed relatively that the hay may be picked by such toothed wheels, and directed between the aprons, and by them elevated, substantially as and for the purpose set forth.

2d, The standards, T T, when so constructed that by their elasticity they shall maintain the upper portions of said aprons face to face, and permit variations in the quantity of hay carried between them, as set forth.

3d, In combination with said endless aprons, the guide boards, so constructed as to pass the hay over the forward apron and on to the wagon.

4th, In combination with said endles aprons, the spur wheels, F and H, and the shaft, I, operating in the slot, I 1, and so constructed as to allow of a forward and backward movement of such shaft and forward apron, substantially as and for the purpose set forth.

2,912.—MEDICAL PREPARATION.—Charles L. Lege, San Antonio, Texas. Patented June 11, 1867.

I claim a medicament produced from the material specified.

2,913.—MEAT CHOPPING MACHINE.—Metropolitan Washing Machine Company, Middlefield, Conn., assignees by mesne assignments of Alfred F. Spaulding, and Salmon M. Scott. Patented January 31, 1865.

We claim, 1st, The employment, in an organized machine for chopping meat, vegetables, and other substances, of a revolving tub, and one or more cutters, and actuating mechanism, under an arrangement substantially as described, so that the meat or other substance shall be cut with a "draw cut," or by a drawing stroke of the said cutters.

2d, The arrangement of the frame, and method of hanging the cutter or cutters in said frame, so that when operated, the cutters shall travel toward the bottom of the revolving tub in a curvilinear path, substantially as herein described.

3d, The combination, with the cutter and its vibratory arm and mechanism whereby it is made to operate with a drawing cut, of the means for adjusting the cutter in said arm for the purpose of regulating the stroke of the said cutter, substantially as set forth.

4th, The method herein described, or its substantial equivalent, of mounting the vibratory arms of the cutters upon a padded pin, or so that the cutters may yield to intervening obstructions, as herein set forth.

5th, The combination, with one or more vibratory cutters, and a tub, of a removable cover overhanging the tub, substantially as herein shown and described.

6th, A machine for cutting meat and other substances, composed of the following elements combined: first, a support for the tub, mounted on a central pivot; second, one or more cutters hung in such manner as to produce, when vibrated, a "draw cut;" third, a mechanism to impart vibrating motion to the cutters, and a rotary movement to the tub.

2,914.—MEAT CHOPPING MACHINE.—Metropolitan Washing Machine Company, Middlefield, Conn., assignees by mesne assignments of Alfred F. Spaulding, and Salmon M. Scott. Patented July 11, 1865.

We claim, 1st, The means for operating the cutter or cutters of a machine for chopping meat, etc., substantially as herein described, so that an up-and-down and back-and-forth movement shall be imparted to the cutter or cutters in the order herein described, thereby effecting an elongated draw cut upon the material to be chopped, as set forth, in combination with a tub rotating during the intervals of stroke, that is to say, when the knive or knives are lifted off the bottom of said tub.

2d, The combination with a rotary tub, of the chopping knives connected directly or through the intermediary of suitable arms, with a revolving crank, so as to operate in the manner and for the purposes herein shown and described.

3d, The combination of cutters with mechanism for vibrating the same in the manner and means herein specified, that is to say, by arms hung upon a revolving crank, and supported by an oscillatory standard.

4th, The combination, with the rotary tub, and one or more chopping knives, and mechanism for moving such knives up and down, and back and forth, in said tub, of a plow, either with or without a guard, adjustable to the frame or other stationary part of the machine in the manner described, so that the same may be held in its proper relation to and within the tub, as set forth.

2,915.—COOKING STOVE.—Philo P. Stewart, Troy, N.Y. Patented April 12, 1859. Dated May 17, 1864.

I claim, 1st, The method or the means, substantially as herein described and set forth, of preventing heat from passing through to the rising flue, leading to the chimney, by separating it from the back oven plate, and from the descending flues, by non-conducting partitions, or the equivalents therefor, and for the purposes herein set forth.

2d, The employment of a double damper, filled with cement or other equivalent non-conducting material, in combination with the flue above the oven, and with the rising flue leading to the chimney, in the manner substantially as and for the purposes herein described and set forth.

3d, The separating of the direct sheet flue, under the oven, from the return sheet flue immediately below the same, by means of the dividing flue plate, i, or any equivalent therefor, constructed, arranged, and combined with the said sheet flues, in the manner and by the means, and for the purposes substantially as herein described and set forth.

4th, The dividing of the space between the bottom plate of the oven and the bottom plate of the stove, by means of the inclined dividing flue plate, i, or any equivalent therefor, in the manner and for the purposes substantially as herein described and set forth.

5th, The employment of the space or chambers, S', in combination with the outer edge of the oven bottom plate, and with the back end oven plate, in the manner and for the purposes substantially as herein described and set forth.

6th, The sheet flue division plate, i, having a recess, h', at each front corner thereof, and the projection, A, between such recesses, substantially as and for the purposes herein described and set forth.

7th, The employment of a broad or sheet flue division plate, i, of any equivalent thereof, in combination with the oven and oven bottom flues, in the manner and for the purposes substantially as herein described and set forth.

8th, The additional bottom plate or encasement, r, in combination with the broad sheet flue, h, or any equivalent therefor, in the manner and for the purposes substantially as herein described and set forth.

DESIGNS.

2,993, to 2,999 inclusive.—FORK OR SPOON HANDLE.—George Wilkinson (assignor to the Gorham Manufacturing Co.), Providence, R.I.

NOTE.—SIXTY patents in the above list were obtained through the Home Office of the Scientific American Patent Agency.—EDS.

PENDING APPLICATIONS FOR REISSUES.

Application has been made to the Commissioner of Patents for the Reissue of the following Patents, with new claims as subjoined. Parties who desire to oppose the grant of any of these reissues should immediately address MUNN & Co., *37 Park Row, N. Y.*

[ISSUED FOR WEEK ENDING MONDAY, MARCH 2, 1868.]

46,300.—COMBINED RAKE AND REEL FOR HARVESTERS.—Samuel Johnston, Buffalo, N.Y. Dated February 7, 1865. Application for reissue received and filed March 19, 1865.

I claim, 1st, In combination with a series of revolving arms carrying heads or rakes which all gather the grain, and a part only of which discharge the grain, I claim so constructing and arranging a cam way as to cause all the heads or beaters to descend to the same gathering level in front of the cutters, and then to elevate those which do not discharge above the cut grain on the platform, and above the level pursued by the discharging head or rake.

2d, In combination with a series of revolving arms, carrying heads or rakes which all gather the grain, and a part only of which discharge the grain, I claim a cam so arranged as to cause all the heads or beaters to descend to the same gathering level in front of the cutters, and a device for throwing those heads, or the teeth thereof, which do not discharge above the cut grain, while passing the platform, and above the level pursued by the heads or the teeth thereof, which so discharge the grain.

3d, In combination with a series of revolving arms, carrying heads or rakes, which all gather the grain, and a part only of which discharge the grain and a cam so arranged as to cause all the heads or beaters to descend to the same gathering level in front of the cutter and then to rise above the cut grain on the platform, and the level pursued by the discharging head, I claim making said cam or a part thereof movable, so as to permit any one of said rakes or heads to descend, while passing the platform, and become a discharging rake or head.

4th, In combination with the movable cam way or partial cam way set forth in the last claim, I claim a cord or equivalent connection, extending to the driver's seat for operating the said cam way so as to regulate the size of the gavel at the will of the driver.

5th, In combination with a series of revolving arms carrying heads or rakes which all gather the grain, and a part only of which discharge the grain, a cam so arranged as to cause all the heads or beaters to descend to the same gathering level in front of the cutters, and a device for throwing those heads, or the teeth thereof, which do not discharge above the cut grain while passing the platform, and above the level pursued by the heads or the teeth thereof, which do discharge the grain. I claim making the said last mentioned device movable, so as to permit any one or more of said heads, or the teeth thereof, to descend to the level of the platform, and discharge the grain.

6th, In combination with the movable device set forth in the last claim I claim a cord or equivalent connection, extending to the driver's seat for operating the said device so as to regulate the size of the gavel at the will of the driver.

7th, In combination with a series of revolving arms, carrying heads or rakes which all gather the grain, and a part only of which discharge the grain, and a cam way so constructed and arranged as to cause all the heads or beaters to descend to the same gathering level, in front of the cutter, and then to elevate those which do not discharge above the cut grain on the platform, and above the level pursued by the discharging head or rake, I claim an auxiliary cam way opposite to the platform, for guiding and controlling the arm of the rake or head, which discharges the grain.

8th, In combination with a series of revolving arms carrying heads or rakes which all gather the grain, and a part of which discharge the grain, and a cam so arranged as to cause all the heads or beaters to descend to the same gathering level in front of the cutters, and a device for throwing those heads or the teeth thereof, which do not discharge above the cut grain while passing the platform, and above the level pursued by the heads or the teeth thereof, which so discharge the grain, I claim an auxiliary cam way opposite to the platform, for grinding and controlling the arm of the rake or head which also discharges the grain.

9th, I claim locating the support for a revolving rake and reel, vertically, over the inner end of the finger beam, and attaching it thereto independently of the platform.

10th, The central hub or head, provided with mortises to receive the revolving arm.

11th, A revolving hub or head combined with arms having knee projections and a cam against which they rotate.

12th, The overhanging extension attachment to the heads or beaters, in combination with the outer divider and rim of the platform.

13th, I claim the combination of the elbow of the rake head, with the roller, and the outer and inner tacks or ways, constructed substantially as described, and for the purposes set forth.

64,100.—HORSE HAY FORK.—Samuel and Daniel A. Harris, Shippensburgh, Pa. Dated April 23, 1867. Application for reissue received and filed March 21, 1868.

I claim, 1st, The combination substantially as set forth in a horse hay fork, of a slotted main bar or shank, A, a lifting finger, C, pivoted centrally in the slot of the shank, and a link rod, D, connecting the finger with the forked lever, E, pivoted to the arm, F, projecting from the shank, and having the tripping rope attached to its upper end, whereby the lifting finger is automatically locked in a horizontal position by the weight of the load.

2d, The combination substantially as set forth, in a horse hay fork, of two parallel rigidly connected shanks, with pivoted fingers, for the purposes specified.

3d, The combination substantially as set forth, of the parallel shanks, the pivoted lifting fingers, the link rods crossing the shanks diagonally, and the cross bar, A', whereby the load is compressed before being elevated.

73,807.—LAWN MOWER.—Amariah M. Hills, Hockanum, Ct.

Dated January 28, 1868. Application for reissue received and filed March 21, 1868.

I claim, the balanced frame on the roller, E, in combination with the bail, Q, to which the handle, S, is secured, all constructed and arranged, substantially as and for the purpose set forth.

2d, The curved shoes, N, in combination with the side pieces, B B, of the frame, said parts being connected together to render the frame adjustable, substantially as shown and described.

3d, The horizontal cutter, M, having the spiral blades, c c, in combination with the fixed cutter bar, D, arranged to operate substantially as set forth.

4th, The combination of the frame, roller shoes, cutting device and handle, all constructed and arranged to operate in the manner substantially as and for the purpose set forth.

56,345.—EXTENSION CORSET SPRINGS.—Frances L. Barnes, New York city, administratrix of the estate of Samuel H. Barnes (deceased). Dated July 17, 1866. Application for reissue received and filed March 21, 1868.

I claim a corset spring, consisting of the parts, B, provided with pins, b, and slotted springs, B2, riveted as shown, and having suitable clasps, C, and headed rivets, D, and of form corresponding to the body of the wearer, constructed and operating in the manner and for the purpose herein represented and described.

48,244.—CIRCULAR BRICK KILN.—Frederich E. Hoffman, Berlin, Prussia. Dated June 13, 1865. Application for reissue received and filed March 24, 1868.

I claim, 1st, an endless or continuous channel, or gallery of any shape in plan, for gradually heating or burning bricks, or other material, the fuel being ignited by a draft of air, which has become heated by passing through the material previously burned, substantially as herein set forth.

2d, The method, substantially as described, of burning bricks, and other material, by fuel of any kind, as wood, coal, coal dust, etc., which is dropped through openings in the top of the burning channel or gallery.

3d, The arrangement of the flues or dampers, and the movable partition or their equivalents, in combination with the continuous channel or gallery, substantially as and for the purpose set forth.

4th, The smoke chamber, which may be circular, or of any other desired form, in combination with the burning channel or gallery, substantially as and for the purpose described.

15,309.—WATER WHEEL.—John Tyler, West Lebanon, N. H. Dated July 8, 1856. Application for reissue received and filed March 26, 1868.

I claim giving the bucket head, e, of my improved water wheel such a degree of curvature as will enable the water to act upon said head, and upon the buckets descending therefrom, substantially in the manner herein set forth.

I also claim the peculiar shape and arrangement of the series of buckets, d d, of my improved water wheel, viz., the convex surface of each bucket being the shape of the segment of a circle, and the said buckets, being arranged with relation to a grinding inner circle, c, and the periphery of the bucket head, e, substantially in the manner herein set forth.

I also claim connecting the lower edges of the buckets, d d, to each other by means of a scollop-edged rim, i, of such a shape that it will conduct the water from the scroll-shaped water way, directly against the central portion of the convex surface of each bucket, and thence smoothly downward between the buckets, substantially as herein set forth.

20,456.—WATER WHEEL.—John Tyler, West Lebanon, N. Y. Dated June 1, 1858. Application for reissue received and filed March 26, 1868.

I claim the combination of the elevated cover, D, with the curb of a water wheel, substantially in the manner and for the purpose herein described.

I also claim giving the elevated curb cover, D, such proportions, and such a degree of strength, as shall enable the box in its apex to form a firm and reliable upper bearing to the water wheel shaft.

I also claim giving the terminating open mouth, B, of the water way of my improved water wheel, such a shape as shall enable the said water way to be brought into connection with the water supplying flume, tube, or trunk.

I also claim the combination of a gate, C, with the terminating open mouth B, of the water way of my improved water wheel, substantially in the manner represented in the accompanying drawings.

52,680.—HORSE RAKE TEETH.—Columbus Coleman, Alleghany city, Pa. Dated February 20, 1866. Application for reissue received and filed March 26, 1868.

I claim, 1st, The use of movable forms for giving the desired curve to rake teeth, in the manner substantially as herein described, and for the purpose set forth.

2d, The combination of movable forms, with suitable mechanism for bending rake teeth, the said movable forms, substantially as herein described and for the purpose set forth.

3d, The use of the header, e, movable forms, B and C, and lever, D, when used in connection with the table, A, constructed, arranged, and operating substantially in the manner herein described, and for the purpose set forth.

☞ NOTE.—*The above claims for Reissue are now pending before the Patent Office, and will not be officially passed upon until the expiration of 30 days from the date of filing the application. All persons who desire to oppose the grant of any of these claims should make immediate application.* *MUNN & CO., Solicitors of Patents, 37 Park Row, N.Y.*

Inventions Patented in England by Americans.

[Compiled from the "Journal of the Commissioners of Patents."]

PROVISIONAL PROTECTION FOR SIX MONTHS.

225.—MANUFACTURE OF SHOES.—Chas. R. Broadbent, Boston, Mass. Jan 22, 1868.

571.—MOVEMENTS FOR CLOCKS AND WATCHES, AND TO CONVERT SPEED INTO POWER.—Wm. F. Goodwin, East New York, N. Y. Feb. 20, 1868.

618.—SPINNING AND TWISTING MACHINERY.—Joseph Nussey, Paterson, N.J. Feb. 25, 1868.

665.—PEN AND PENCIL HOLDER.—John T. Price, Arrow Rock, Mo. Feb. 27, 1868.

708.—APPARATUS FOR BURNING HYDROCARBONS.—Chas. L. Perkins, New York city. March 2, 1868.

729.—FILE CUTTING MACHINE.—Hugh Kennedy, New Orleans, La. March 3, 1868.

769.—APPARATUS FOR CULTIVATING LAND AND SOWING SEED.—David D Stelle, New Brunswick, N. J. March 5, 1868.

© 1868 SCIENTIFIC AMERICAN, INC.

Advertisements.

RATES OF ADVERTISING.

Back Page.....$1.00 *a line.*

Inside Page.....75 *cents a line.*

Engravings may head advertisements at the same rate per line, by measurement, as the letter press.

BUCKWHEAT HULLER—State Rights for sale. Address Joseph Baysore, Freeport, Ill. 1*

PATENTED FELLY BENDERS, of the "Center Bending" Class—and Rights for sale. JOHN C. MORRIS. No. 120 East 2d st., Cincinnati, Ohio.

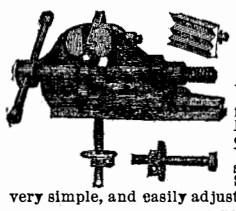
HOW IT WAS DONE.—I will send recipe and instructions for Cold Brazing for one dollar and one postage stamp. WM. A. SWEET, Engineer, Syracuse, N. Y.

WISELLS' SPOKE LATHE.—Turns two and three at a time, of Ax, Pick, Hammer, Plow, and Sledge Handles, and, also, of all kinds of irregular work in wood. Sold in Pennsylvania only by 17 tf BECKWITH, SELLERS & CO., Franklin, Pa.

CANVASSERS wanted for the combined stamp attacher, letter sealer, inkstand, pen rack and wiper, calendar check and envelope case. Expressed, prepaid, for $5. Circulars free. Address 17 4* J. H. MARTIN, Hartford, N. Y.

DIRECT-ACTING STEAM PUMPS,—and Boiler Feeders, in lieu of Injectors. Address, for circulars, the Sole Manufacturers, COPE & CO., No. 118 East 2d st., Cincinnati, Ohio.

TERRITORY FOR SALE. We offer great inducements to persons in our Patent Excelsior Self Ventilating Blacksmith Tweer. We offer our Patent Right on the most reasonable terms. For further particulars apply to LAIRD & HEIGLY, Mechanicsburgh, Pa. 17 1*

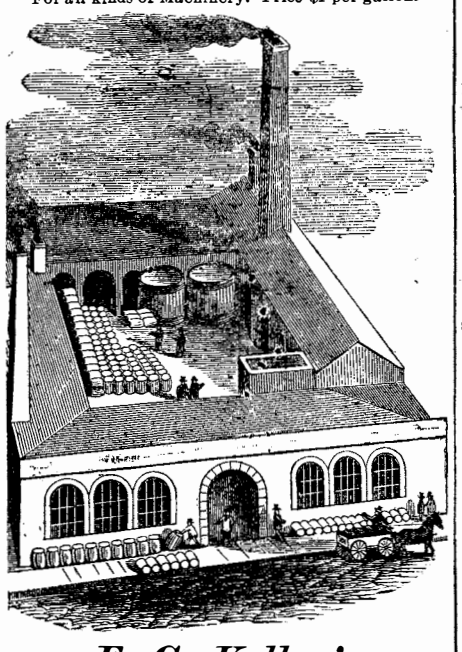


UNION *VISE CO.*, OF BOSTON, MASS., Make VISES of all KINDS, for very heavy or light work. Pipe Vises, with or without extra jaw. Wood-worker's Vises. Vises with covered screws. Send for price list. Standard Milling Machines, very simple, and easily adjusted. 1

E. G. KELLEY'S

1ST PREMIUM PATENT SPE M OIL,

For all kinds of Machinery. Price $1 per gallon.



E. G. Kelley's

REFINED ROCK OR MECCA OIL,

for Railroads, Steamers, and Factories. Price 50 cents. Testimonials furnished, when desired, by persons who have used the oil for years. A liberal discount to the trade. Office 102 and 104 Maiden Lane, New York. 17 1em

MACHINISTS send for Price List of Tools. GOODNOW & WIGHTMAN, 23 Cornhill, Boston. 17 tf

EARL, SMITH & CO.'S

PRE-ANNEALED

Round Machinery,

CAST STEEL.

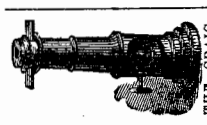
Finest produced by any living manufacturer. Try it for yourselves. Agency and warehouse, 24 and 26 Fulton st. 1* JAMES SKINNER, Agt., Boston, Mass.

THE WATCH.—A very useful Book for every one about buying or wearing a Watch. Recommended by the Principal Watch Makers, Importers, and Dealers, in New York, etc. THE WATCH—Treating of its construction—How to Choose and How to Use it, etc. By a Watchmaker of over forty years practical experience. Second Edition, improved and Enlarged. A copy sent by mail, postpaid, on receipt of 60 cents. Address the author, H. F. PIAGET, 119 Fulton st., New York.

BUSINESS OPPORTUNITY.—The Subscriber has a factory, with steam engine and other machinery, all in good running order. Situated about 30 miles from the city, with railway and water navigation, that he offers for sale, or he will engage with some party in the manufacture of such articles as they may name, that will afford large profits and sure sale. For further particulars inquire of JOHN SMALLEY, 1* Bound Brook, N. J.

LABORATORY OF INDUSTRIAL CHEMISTRY.—Advices on chemistry applied to arts and manufacturers, metallurgy, agriculture, etc. Informations on chemical fabrications, with plans of factories and apparatus. Analyses of every kind. Address Prof. H. DUSSAUCE, chemist, New Lebanon, N. Y. 17 2*

WATER WHEELS.—Valentine's Patent Turbine is economical and durable. Built by VALENTINE & CO., Ft. Edward, N. Y. 17 2



THE CRAIG MICROSCOPE. SEND to J. HALL for recent detailed Testimonials of its use in Entomology, Physiology, Pathology, etc.; also wholesale terms. Micros'pe sent for $2 75 by John Hall, Bergen, N.J., or S.R. Wells, 389 Broadway, N.Y.

A PORTABLE ENGINE AND BOILER for sale Cheap, of best Material and Workmanship. Has been in use but three months. Will be sold very low. Call on or address JNO. ASHCROFT, 17 3 50 and 52 John st., New York.

DON'T USE DULL SCISSORS.—Jacobs' Patent Scissors Sharpener—the Staple Sharpener for family use. Samples postpaid 25 cents, or circulars for stamp. GREAT INDUCEMENTS TO AGENTS. SOUTHWIC & HASTINGS, Worcester, Mass.

GREAT ECONOMY IN

WATER POWER.

LEFFEL'S DOUBLE TURBINE WATER WHEEL.—Best Wheel in Existence.—Manufactured by JAS. LEFFEL & CO., at Springfield, Ohio, and New Haven, Conn. New Illustrated Pamphlet for 1868 sent free on application. 12 40s* 16 4is*

Cheap, Useful, AND *Elegant.*

IMPROVED BRONZE ALUMINUM HUNTING CASED WATCHES, (the qualities and resemblance of this new metal are such, compared to Gold, that even judges are deceived), and ROSKOPF'S PATENTED PEOPLE'S WATCH.

The Improved Bronze Aluminum of which my watches are made, is a metal differing entirely from any ever offered to the public. It has seriously occupied the attention of scientific men, and has not only called forth the eulogium of the press, in consequence of its peculiar properties, but has also obtained a Gold Medal at the Paris Exposition and even been favorably noticed by rescript of his holiness, Pius IX., authorizing its use in the manufacturing of church goods.

The qualities of this metal are such that it is surpassed by none, if we except gold itself, and that only on account of the intrinsic value of the latter. Further details will be found in my circular, which will be sent, postpaid, on demand.

My Watches are of three sizes, all hunting cases, one small for Ladies or Lads, and two for Gents. The movements are well finished, and perfectly regulated. I can, therefore, warrant them excellent time-keepers. These goods being manufactured in my own factory, I am enabled to sell any of the above sizes at the extremely low price of $16.

A full assortment of all kinds of Chains always on hand.

Goods sent by Express, C. O. D., with charges. Not responsible for money sent inclosed in letters. Address JULES D. HUGUENIN VUILLEMIN, tf] No. 44 Nassau Street, New York.

RICHARDSON, MERIAM & CO., Manufacturers of the latest improved Patent Daniels' and Woodworth Planing Machines, Matching, Sash and Molding, Tenoning, Mortising, Boring, Shaping, Vertical and Circular Re-sawing Machines, Saw Mills, Saw Arbors, Scroll Saws, Railway, Cut-off, and Rip Saw Machines, Spoke and Wood Turning Lathes, and various other kinds of Wood-working machinery. Catalogues and price lists sent on application. Manufactory, Worcester, Mass. Warehouse, 107 Liberty st., New York. 13tf

WOODWORTH PLANERS A SPECIALTY—From new patterns of the most approved style and workmanship. Wood-working Machinery generally. Nos. 24 and 26 Central, corner Union street, Worcester, Mass. 15 tf WITHERBY, RUGG & RICHARDSON.

WANTED—Ladies and Gentlemen everywhere, in a business that will pay $5 to $20 per day; no book, patent right, or medical humbug, but a standard article of merit, wanted by everybody, and sold at one third the usual price, with 200 per cent profit to our agents. Samples and circulars sent by mail for 25 cents. 12 tf] WHITNEY & SON, 6 Tremont st., Boston, Mass.

IRON & WOOD WORKING MACHINERY

TURBINE WATER-WHEELS.

LUCIUS W. POND,

85 LIBERTY ST. N.Y. and Worcester, Mass. 15 tf

For Sale Below Cost.

FIFTEEN PORTABLE STEAM ENGINES, Different Sizes; 8 Portable Flour Mills; 6 Lane's Patent Circular Saw Mills; 1 Muley Saw Mill, Anderson's Patent, and other Machinery. Send for printed description to Washington Iron Works, Newburgh, N. Y., or to WARD & STANTON, 57 Liberty st., New York. Orders for Steam Engines, Boilers, and general machinery solicited. 16 4

SCREW-BOLT CUTTERS.—Schwirtzer's Patent Bolt Cutters, with an equal amount of power and labor, will cut twice as many bolts as any other machine in use. For sale by the SCHWIRTZER PATENT BOLT CO., Green Point, Brooklyn, E. D., N. Y.

Agents Wanted.

FOR THE LIFE OF GEN. U. S. GRANT, By Hon. Henry C. Deming. The only work of the kind issued under the sanction and by the authority of Grant himself. The author is well known as one of the most brillian writers and eloquent orators in the country. Agents will find this one of the most intensely interesting Biographies ever published in America, and will meet with a ready sale. For particulars, address S. S. SCRANTON & CO., 126 Asylum st., Hartford, Ct. 16 4

PLATINUM. H. M. Raynor, 748 Broadway, N. Y.

FOR BRASS LATHES and all Machinery connected with Brass Finishing and Fitting Line. Improved Lathes for making large valves etc. Address Exeter Machine Works, Exeter, N. H. 13 tf

WROUGHT-IRON BEAMS & GIRDERS

THE UNION IRON MILLS, Pittsburgh, Pa.—The attention of Engineers and Architects is called to our Improved Wrought-Iron Beams and Girders (Patented), in which the compound welds between the stem and flanges, which have proved so objectionable in the old mode of manufacturing, are entirely avoided, we are prepared to furnish all sizes at terms as favorable as can be obtained elsewhere. For descriptive lithograph address the UNION IRON MILLS, 5 13* Pittsburgh, Pa.

CHARLES A. SEELY, CONSULTING and Analytical Chemist, No. 26 Pine street, New York. Assays and Analyses of all kinds. Advice, instruction, Reports, etc., on the useful arts. 1 tf

SPRINGFIELD BRASS FOUNDERY, E Stebbins' Manufact'ng Co., Spring'd, Mass., furnish to order every variety of brass and composition castings, car boxes, letters, Babbitt metal, etc., of superior quality. Sample castings can be seen and orders left at Hayden, Gere & Co.'s, 84 Beekman st., N.Y., and Dalton & Ingersoll's, 17 & 19 Union st., Boston. 8 13*

STEAM AND WATER GAGES, STEAM Whistles, Gage Cocks, and Engineer's Supplies. 12 12*] JOHN ASHCROFT, 50 John st., New York.

BABCOCK & WILCOX'S PATENT STATIONARY STEAM ENGINES, From 25 to 1,000 horse-power, built in the best manner and at the shortest notice by the South Brooklyn Steam Engine & Boiler Works Imlay, Summit, and Van Brunt sts., Brooklyn, N. Y. ☞ Over 4,000 horse-power of these engines are now running and contracted for. 108* D. McLEOD, Proprietor.

BEST PLANERS & WOOD TOOLS as formerly, by E. C. TAINTER, Successor to J. A. FAY & CO., Worcester, Mass. 8 tf

BOILER FELTING SAVES TWENTY-five per cent of Fuel. JOHN ASHCROFT, 12 12*] 50 John st., New York.

PORTABLE STEAM ENGINES, COMbining the maximum of efficiency, durability, and economy with the minimum of weight and price. They are widely and favorably known, more than 600 being in use. All warranted satisfactory or no sale. Descriptive circulars sent on application. Address J. C. HOADLEY & CO., Lawrence, Mass. 1 tt

RAILROAD, STEAMSHIP, MANUFACturers, and Engineer's Supplies, of all kinds, at 1 24* M. T. DAVIDSON & CO.'S, 84 John st., N. Y.

STOCKS, DIES, AND SCREW PLATES, Horton's and other Chucks. JOHN ASHCROFT, 50 John st., New York. 12 12*

WHEELER & WILSON, 625 BROADway, N. Y.—Lock-stitch Sewing Machine and Buttonhole do. 1 tf*

POWER PUNCHES AND SHEARS, Straightening Machines, Vertical Drills, etc. Address GREENLEAF & CO. Indianapolis Ind. 7 13* tf

PHOENIX IRON WORKS— Established 1834. GEO. S. LINCOLN & CO., Iron Founders and Manufacturers of Machinists and Gun Tools, 54 to 60 Arch street, Hartford, Conn. Samples may be seen in our Wareroom. 14 tf

YOU CAN SOLDER your own tin ware without a soldering iron by buying one bottle of Wilson's Prepared Solder. Samples sent on receipt of 35 cents, with price list. Agents wanted everywhere. Direct to WILSON & CO., 19 Lindall st., Boston. 11 tf-D

FARMER'S THERMO-ELECTRIC BATTERY, W. H. Remington, Manufacturer and Agent. Manufactory at Cohasset, Mass. Office and Salesroom, No. 109 Court street, Boston, Mass. This Battery does away entirely with acids, quicksilver, or liquids of any kind, the electrical current being generated by the action of heat, a simple gas burner being all that is required to put this battery into action. It is clean, constant, and requires no care, performing the work of any acid battery. 14 tf

Sault's Patent

FRICTIONLESS Locomotive Valves, easily applied; requires no changes. 12 tf] M. & T. SAULT COMPANY, New Haven, Conn.

PATENT SHINGLE, STAVE, AND Barrel Machinery, Comprising Shingle Mills, Heading Mills, Stave Cutters, Stave Jointers, Shingle and Heading Jointers, Heading Rounders and Planers, Equalizing and Cut-off Saws. Send for Illustrated List. 5 tf] FULLER & FORD, and 284 Madison street, Chicago Ill.

"BENEDICT'S TIME," for this Month. Timetables of all Railroad and Steamboat lines from New York, with City Map, 25c., sent by mail. BENEDICT BROS., Jewelers, 171 Broadway. BENEDICT BROS., up town, 691 Broadway. BENEDICT BROS., Brooklyn, 234 Fulton st. 1 tt

WROUGHT-Iron Pipe for Steam, Gas and Water; Brass Globe Valves and Stop Cocks, Iron Fittings, etc. JOHN ASHCROFT, 50 John st., N. Y. 12 12*

A WATCH FOR $1. THE MAGNETIC Time Indicator and Compass, in a neat case, with glass shade, steel and German Silver works, white enamelled dial, ordinary watch size, sound and serviceable. Warranted to denote correct time, and keep in order for two years. Where satisfaction is not given, the money will be returned. Sent, postpaid; for $1; three for $2; or by express, C.O.D., on receipt of $1 as a guarantee. Address HUNTER & CO., Hinsdale, N. H. 16 3

Brick Machine.

LAFLER'S NEW IRON CLAD has more advantages combined in one machine than any other ever invented. It makes common brick of very superior quality. By a slight change, press brick are made without repressing. With Lafler's Patent Mold, beautiful stock brick are made. This machine was awarded first premium at the N. Y. State Fair, 1867, for making Front Bricks. Examining Committee awarded special report, indorsing this machine. For descriptive circular address J. A. LAFLER & CO., 15 tf eow Albion, Orleans county, N. Y.

P.S. PRICE LIST OF STUBS' Files & Tools. Also, U.S. Standard Steel Scales, Squares, etc. Steel letters & Figures. Sent to any address. GOODNOW & WIGHTMAN, 23 Cornhill, Boston, Mass. 13 eowtf

LE COUNT'S PATENT HOLLOW LATHE DOG is Light, Thin, and of at least Double the Strength of others. They have Good Steel Screws, well fitted and Hardened. Prices From ¾ to 2 inches, 8 sizes, inc.....$ 8 00 do. ¾ to 4 do. 12 " " ..... 17 30 Sent by Express to any address. For circular send to C. W. LE COUNT, South Norwalk, Conn. 13 eowtf

HYDRAULIC Jacks and Punches, Improved. Manufactured by E. LYON, 470 Grand st., New York. Send for a circular. 1 eow13*

TUBE WELLS.—Patented Jan. 21, 1868. The LATEST and BEST.—Warranted to operate where any other will work, and in hundreds of places where others will not. Territory sold by Towns, Counties, or States, for cash or saleable property. Township Rights $25 each, which is the profit on one well of 20 feet. Individual Rights $5 each. Address 11 7 eow* W. T. HORNER, Buffalo, N. Y.

CHASE'S DOLLAR MICROSCOPE AND Bank Note Detector. Agents wanted everywhere. Constant, steady, and profitable employment. Also, two other valuable inventions, just out. Send $1 for sample and circular. Address O. N. CHASE, 81 Washington st., Boston, Mass., or FOWLER & WELLS, 389 Broadway, New York city. 11 4 eow

HOISTING APPARATUS FOR MINES, etc., with our Patent Friction Clutches attached with a variety of sizes of Drums and Gearing, manufactured by VOLNEY W. MASON, 4 mthly] Providence, R. I.

ALCOTT'S CONCENTRIC LATHES.—For Broom, Hoe, and Rake Handles, Chair Rounds, etc., and all other kinds of Wood-working Machinery, for sale by S. C. HILLS, 12 Platt st., New York 1 tf a

Philadelphia Advertisements.

☞ Philadelphia Advertising Patrons, who prefer it, can have their orders forwarded through T. V. Carpenter resident Agent, 313 North Sixth street.

Morris, Wheeler & Co.,

1608 Market st., Philadelphia, Manufacturers & Dealers in IRON, STEEL, AND NAILS, Boiler and Plate Iron, Rivets, etc. New York Office, 24 Cliff st. Works at Pottstown, Pa. 17 13

TO BUILDERS, CAR COMPANIES, and others, Jenkins' Patent Self Sash Hanging, for Dwellings, Railroad Cars, etc. State and County Rights for sale. Agents wanted. C. R. JENKINS & CO., 17 4* No. 9½ N. 10th st., Philadelphia, Pa.

Banks, Dinsmore & Co.

Manufacturers of Standard Scales of all Varieties, 9th st., near Coates, Philadelphia. 17 13

SHAW'S "PARAGON"

LATHE TOOL

Is a tough Steel Stock, arranged for interchangeable Cutters, made of Diamond Cast Steel. See illustration in Scientific American of April 4th. Each cutter is shaped and tempered, and merely requires grinding, thus saving all dressing at the forge, and time in waiting. The Thread Cutters are milled to the proper angle, which is maintained until it is used up. Each tool will save its cost in men's time in a few days, and frequently in 24 hours of steady work. After a trial no one will be without them. Size No. 1, is ⅝x1½, price $3, complete. Extra cutters 25 cents. Manufactured by Patentee, PHILIP S. JUSTICE, No. 42 Cliff st., New York. No. 14 N. 5th st., Philadelphia. 16 4

MERRICK & SONS, Southwark Foundery,

PHILADELPHIA, Pa.,

MANUFACTURE Steam Hammers of Nasmyth and Davy styles.

Apparatus for Making Sugar from Beet Root & Cane Juice, & for Refineries working Sugar & Molasses

Gas Machinery of every description.

Oscillating Engines having SLIDE VALVES worked by ECCENTRIC.

Patterns on hand of sizes—8x10, 10x12, 14x14, 18x12.

N. B.—Designers and constructors of the machinery for the Forest City Sugar Refining Co., Portland, Me. C. Y. Morriss Sugar Refinery, Richmond, Va. Southwark Sugar Refinery, Philadelphia, Pa. Grocers' Sugar House (Molasses), do. 17 eow tf

TAWS AND HARTMAN.—All kinds of Brass Cocks, Gages, Valves, etc. Special fittings for Blast Furnaces and Rolling Mills, Machine Jobbing, and Drafting. Ross & Holland pat. Tallow Cups. 1237 North Front st., Philadelphia, Pa. 15 7eow

ENGINE LATHES—A Specialty.—Send for circular. HARRINGTON & HASKINS, 16 4 Cor. 15th st. and Penn. ave. Philadelphia.

SLIDE LATHES, Iron Planers, Upright Drills, Bolt Cutters, Compound Planers, Universal Chucks, Gear Cutters, etc., at reduced prices. Address 15 13 CHAS. H. SMITH, 135 North 3d st., Philadelphia.

ALBRECHT, RIEKES & SCHMIDT.

MANUFACTURERS OF 1ST-CLASS PIANO FORTES No. 610 Arch street, 15 13 Philadelphia, Pa.

Merchandise Tags,

Patent Direction Labels, Shipping Cards, etc. Samples sent on application. DENNISON CO., 15 4 36 South Third st., Philadelphia, Pa.

KENSINGTON IRON WORKS.—Stationary and Portable Engines of any required size made to order. Also, Locomotive, Flue, Cylinder, and Marine Boilers. Tug Boats and Propeller Yachts of any required length, breadth of beam, and Power. 15 8 A. L. ARCHAMBAULT, Philadelphia, Pa.

C. WEST MYERS, STEAM ENGINE Builder and dealer in new and second-hand Steam Engines, Boilers, Lathes, Planers, and other machinery, No. 245 North Front street, Philadelphia, Pa. Reliable references throughout the United States. 14 4

FIRE-PROOF CONSTRUCTION.—GILbert's Corrugated "Iron Ceiling," for fire-proof buildings. Office No. 429 Walnut street, Philadelphia. Wrought Iron Beams of all sizes. All kinds of Corrugated Iron. Fire-proof Buildings constructed. 14 13 JOS. GILBERT, Superintendent.

Cedar Vats, Tanks, and Reservoirs,

For Brewers, Distillers, Dyers, Chemists, Manufacturers etc., Public and Private Buildings, etc., etc. GEO. J. BURKHARDT & CO., 8 13*] Buttonwood, below Broad st., Philadelphia, Pa.

Bridesburg Manf'g Co.,

Office No. 65 North Front Street, PHILADELPHIA, Pa.,

Manufacture all kinds of Cotton and Woolen Machinery including their new

Self-Acting Mules and Looms,

Of the most approved style. Plans drawn and estimates furnished for factories of any size. Shafting and mill gearing made to order. 7 13* tf

POWERLOOMS. Improved Drop Box

Spooling, Winding, Beaming Dyeing, and Sizing Machines, Self-Acting Wool Scouring Machines, Hydra Extractors Also, Shafting, Pulleys, and Self-Oiling Adjustable Hangers, manuf'd by THOS WOOD, 2106 Wood st., Phil'a, Pa. 6 13*

FOREMAN AND MOLDER WANTED. Address STEARNS, CLARK & CO., Erie, Pa. 16 3

OIL! OIL!! OIL!!!

FIRST PREMIUM.....PARIS, 1867

Grand Silver Medal and Diploma!

WORLD'S FAIR—London, 1862.

TWO PRIZE MEDALS AWARDED

PEASE'S IMPROVED OILS!

Engine, Signal, Lard, and Premium Petroleum is the Best Made for Railroads, Steamers, and for Machinery and Burning.

F. S. PEASE, Oil Manufacturer, Nos. 61 and 63 Main street, Buffalo, N. Y. N B.—Reliable orders filled for any part of the world. 6 tf

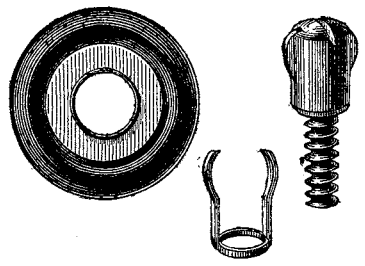
© 1868 SCIENTIFIC AMERICAN, INC.

Advertisements.

A limited number of advertisements will be admitted on this page at the rate of $1 per line. Engravings may head advertisements at the same rate per line, by measurement, as the letter press.

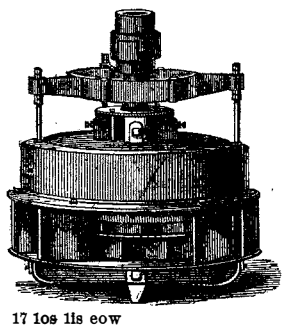
CASE & BARCLAY'S

IMPROVED PATENT
CARRIAGE KNOB AND BUTTONHOLE.
Covered by Three Patents.



THIS Device is Superior to all other Carriage Fasteners now in use, as it allows the curtain to be readily fastened, but prevents it from becoming spontaneously disengaged from the Knob. By compressing the springs on the Knob, the curtain can be unbuttoned. The Knobs are beautifully gotten up, either plain, brass, silv erplated, or japanned. Send for price list and samples t o CASE, BARCLAY, & CO.,
17 10s Attleborough, Mass.

WATER WHEELS.



THE DUPLEX TURBINE.—Especially adapted to variable streams, for large or small quantities of water. Gives the same proportion of power to the water used with a partial as with a full gate, something never before accomplished. The smaller wheels kept on hand ready to ship. All wheels guaranteed. Reliable men wanted as Agents.
J. E. STEVENSON, Hydraulic Engineer
88 Liberty st., N. Y.
17 10s 11s eow

WIRE ROPE.

Manufactured by
JOHN A. ROEBLING
Trenton, N. J.

FOR Inclined Planes, Standing Ship Rigging, Bridges, Ferries, Stays or Guys on Derricks and Cranes, Tiller Ropes, Sash Cords of Copper and Iron, Lightning Conductors of Copper. Special attention given to hoisting rope of all kinds for Mines and Elevators. Apply for circular, giving price and other information. 17 5*os

ASBESTOS

THIS Indestructible Mineral differs from all others in possessing fine silk-like fibers which render it capable of being woven into cloth. It is now manufactured (after being crushed or ground) into a fire and water-proof coating for roofs, which can be applied with a brush, and a cement for joints and fissures in stone, wood and metals, and for repairing leaks in roofs, of all kinds, and around chimneys, dormer windows, etc.
We GUARANTEE these materials to be superior to everything heretofore used for such purposes, the fibers of Asbestos giving them strength and tenacity on the principle of hair in mortar.
ASBESTOS ROOFING, 3½ to 7½ cents per square foot.
ASBESTOS ROOF COATING, 75c. and $1 per gallon.
ASBESTOS CEMENT, in 10-lb. pails, 10c. per lb.
For sale by Hardware and Paint Dealers, and at Drug and general Stores. Descriptive circulars will be furnished to all who are interested in the newly-discovered uses of this wonderful mineral.
H. W. JOHNS, Patentee,
And for ten years manufacturer of Improved Roofing Materials, 78 William st., New York.
"We consider this invention one of great value."—Eds. Scientific American. 15 10s*

HOWE'S NEVER FAILING AGUE Cure and TONIC BITTERS. Warranted to cure or no pay. Also, HOWE'S CONCENTRATED SIRUP, for blood, liver, skin, CANCERS, etc. Price each $1, or 6 bottles for $5. Address sole proprietor, C. B. HOWE, M.D., Seneca Falls, N.Y.
15 3*os

A PRACTICAL WORKSHOP COMPANION for Tin, Sheet Iron, Copper, and Boiler Plate Workers, Plumbers, etc. Send for a circular.
LEROY J. BLINN,
15 4 44 Woodward Ave., Detroit, Mich.

SPICE CAN AND BLACKING BOX Rivetiug Machines (Improved), Foot or Power. Send for circulars and sample.
W. PAINTER & CO., Patentees,
15 13 45 Holliday, st., Baltimore.

ANDERSON'S PATENT MULEY SAW Hangings. The oscillating lower Muley and self-adjusting rake upper Muley performs ⅓ more work with ⅓ less power than any other. COE & WILKES, Painesville, Ohio, sole manufacturers, except for the States of Maine and Pennsylvania. Send for circulars. 15 8

A GOOD THING.—HOW TO GET IT. Would you know what you can do best? What calling or pursuit to follow in life? And how to make the most of yourself? Read the PHRENOLOGICAL JOURNAL. It has a very large circulation, is now in its 47th Vol., and only $3 a year. Or the JOURNAL and SCIENTIFIC AMERICAN for $5. Address S. R. WELLS, or MUNN & CO., New York. 15 4

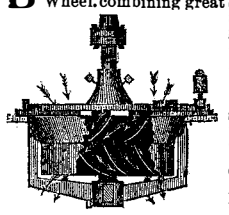
LATHE CHUCKS—HORTON'S PATENT—from 4 to 36 inches. Also for car wheels. Address. E. HORTON & SON, Windsor Locks, CONN. 4 13*

BUERK'S WATCHMAN'S TIME DETECTOR.—Important for all large Corporations and Manufacturing concerns—capable of controlling with the utmost accuracy the motion of a watchman or patrolman, as the same reaches different statio s of his beat. Send for a Circular.
J. E. BUERK,
P. O. Box 1,057, Boston, Mass.
N. B.—This detector is covered by two U. S. patents. Parties using or se ling these instruments without authority from me will be dealt with according to law. 15 12*

A NEW CLASS IN PRACTICAL PHRENOLOGY is forming. For circular, with full particulars, address, with stamp "Phrenological Journal," New York. 14 4

SULPHUR MANUFACTURERS.—The Patent of Dr. Sincay, for the Manufacture of Sulphur, patented Oct. 30, 1866, is offered for sale. It is a very valuable invention, and is in extensive use abroad. For further particulars address
ST. PAUL DE SINCAY,
La Vieille Montague, Belgium, care Scientific merican office, New York. 15 3

BODINE'S JONVAL TURBINE WATER Wheel, combining great economy in the use of water, simplicity, durability, and general adaptation to all positions in which water can be used as a motive power. We are prepared to furnish & warrant the same to give more power than any overshot or other turbine wheel made using the same amount of water. Agents wanted.
Send for descriptive circular.
BODINE & CO.,
Mauu f'g, Mount Morris, N. York, and Westfield, Mass.



17 os tf eow

Pressure Blowers

OF ALL SIZES, for purposes where a blast is required. For particulars and circulars, address B. F. STURTEVANT, No. 72 Sudbury st., Boston, Mass.
17 ostf

J. F. WERNER, Model Maker & Machinist, 62 Center st., N. Y. Particular assistance given to inventors in developing their designs. Tools made to order.
17 1*os

TO CARPENTERS, Manufacturers, etc., this Patent Saw Set is a most valuable tool. It sets all kinds of saws with great ease, perfectly true on both sides as you go over it. Circular saws need not be taken out of the mandrel. All sets made of steel and warranted. Liberal discount to Agents. For terms, etc., address NORTON, LIBBY, & Co., Manuf's and Proprietors, 339 Mill st., Poughkeepsie, N.Y.
17 10s

ADJUSTABLE DRILL CHUCK—holds from ⅛ to ½-in. $3. Improved Lathe Dog, carries from ⅛ to ¾-in. diam. Light and strong—will take the the place of full set of ordinary dogs. Price $1. Address AMERICAN TWIST DRILL CO., Woonsocket, R. I.
17 ostf eow

WANTED—A New or 2d-hand dredge Machine for Hydraulic purposes. Address, with particulars, H. WEAKLEY,
Secretary Dayton View Hydraulic Co., Dayton, Ohio.
17 10s*

Band Saws and Files.

FRENCH BAND SAW MACHINES and SAWS—
For Sawing Logs and Reslitting. Also, for Light and Heavy work. G. GUEUTAL,
1*os 39 West Fourth st., New York.

EMERSON'S PATENT MOVABLE-TOOTHED CIRCULAR SAWS SUPERIOR TO ALL OTHERS. FOR DESCRIPTIVE PAMPHLET ADDRESS AMERICAN SAW Co. N.Y.

EMERSON'S PATENT PERFORATED CIRCULAR & LONG SAWS REQUIRE NO GUMMING. FOR DESCRIPTIVE PAMPHLET ADDRESS AMERICAN SAW Co. N.Y.

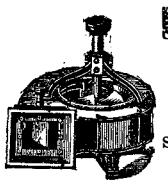
Factory, Trenton, N. J. Office, No. 2, Jacob st., N. Y. 14 tf

FREE. Our New Catalogue of Improved STENCIL DIES. More than $200 A MONTH is being made with them S. M. SPENCER & CO., Brattleboro, Vt. 6ostt

IRON PLANERS, ENGINE LATHES, Drills, and other Machinists' Tools, of Superior Quality, on hand and finishing. For Sale Low. For Description and Price, address NEW HAVEN MANUFACTURING CO., New Haven. 5 os tf

Ready Roofing

READY ROOFING.—The first customer in each place can buy 1000 feet of Roofing at half price—$25. Samples and circulars sent by mail. Ready Roofing Co., 81 Maiden Lane, New York. 12 tf os

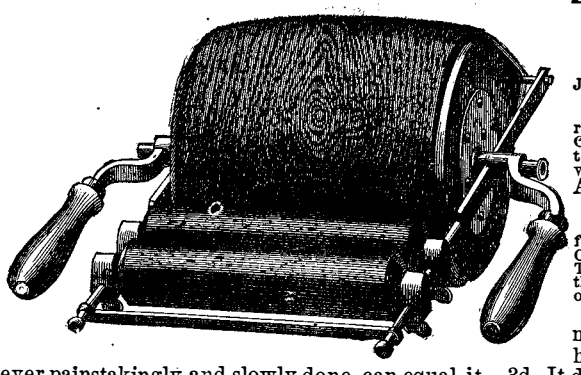


Reynolds'

TURBINE WATER WHEELS
And all kinds of
MILL MACHINERY.
Send for Illustrated Pamphlet.
GEORGE TALLCOT,
96 Liberty st., New York.
14 13* os

WHEATON'S OINTMENT cures the Itch
WHEATON'S OINTMENT will cure Salt Rheum.
WHEATON'S OINTMENT cures Old Sores.
WHEATON'S OINTMENT cures all diseases of the Skin.
Price 50 cents;—by mail 60 cents. All Druggists sell it.
WEEKS & POTTER, Boston, Proprietors. 2 tf os

Our Pail Machine, with Two Boys, can Grain Two Thousand Pails per Day.



1ST PREMIUM MEDAL AWARDED.
WM. H. MURPHY, } Judges,
THEO. L. DE VINNE, }
JNO. W. CHAMBERS,
Sec. Am. Institute.

The attention of Painters, Manufacturers of Woodenware, Cottage Furniture, Coffins, Refrigerators, Sleighs, Agricultural Implements, Chairs, etc., etc., is invited to
AIR CYLINDER GRAINING MACHINE.
This machine Grains in Oil Colors, perfect imitations of Walnut, Rosewood, Chestnut, and Oak, in all their varieties. The impressions are as sharp and true as those of the photograph. The advantages of this machine are:—
1st. It performs many times as much labor as can be done by hand. 2d. No hand work, however painstakingly and slowly done, can equal it. 3d. It does not require a highly skilled workman. 4th. It is adapted to all kinds of work, and can be applied to any surface, flat or curved. 5th. The machine is substantially made of vulcanized rubber, with brass side-plates, so simple and durable that it will last for years without getting out of order. 6th. *By an improvement made last year, the figure can be carried close to the ends of the panel.* 7th. *The pattern plates are now reinforced by a patent backing, which prevents their breaking.*
☞ This machine has taken the First Premium at the American Institute Fair, this year. See Report of Committee. Also, see Scientific American, August 8, 1867. Samples of the work done on exhibition at the office. For circulars and further particulars address,
9 6os eow HEATH, SMITH & CO., 44 Murray street, New York.

$10 TO $20 A DAY GUARANTEED.
GOOD Agents wanted to introduce our new **Star Shuttle Sewing Machine**—Stitch alike on both sides. The only first-class, low-priced machine in the market. We will consign Machines to responsible parties, and employ Energetic Agents on a Salary. Full particulars and sample work furnished on application. Address W. G. WILSON & CO., Cleveland, Ohio, Boston, Mass., or St. Louis, Mo. 13 6os

SCALE IN STEAM BOILERS.—An unobjectionable article for the removal and prevention of incrustations is now offered to the public by M. A. GLYNN & CO.,
14 4os* Of No. 80 Cedar st., New York.

ASHCROFT'S LOW WATER DETECTOR will insure your Boiler against explosion. JOHN ASHCROFT, 50 John st., New York. 12 12*

LENOIR GAS ENGINES, From half-Horse to three Horse-power, for sale at COMPANY'S OFFICE, No. 26 Pine st., Room 8, New York. 1 21*

MODELS, PATTERNS, EXPERIMENTAL, and other Machinery. Models for the Patent Office, built to order by HOLSKE MACHINE CO., Nos. 528, 530, and 532 Water street, near Jefferson. Refer to SCIENTIFIC AMERICAN office. 14 tf

J. R. ROBINSON, Consulting and Superintending STEAM ENGINEER,
28 State st., Boston, Mass.
☞ Particular attention given to Inspecting and Testing Steam Machinery, as to safety of Boilers, power of Engines, and as to the useful effect of fuel consumed.
14 5*

EMPLOYMENT.—$15 to $30 a day guaranteed. Male or Female Agents wanted in every town—descriptive circulars free. Address
15 13—N.] JAMES C. RAND & CO., Biddeford, Me.

FOR STEAM ENGINES, BOILERS, SAW Mills, Cotton Gins, address the ALBERTSON AND DOUGLASS MACHINE CO., New London, Conn. 15 tf

HYDRAULIC PRESSES FOR SALE.—1 set Vertical Hydraulic Presses, 5 bags each, with pumps, heater, and driving shaft complete, for Linseed, Cotton, Mustard, or Castor Oil. 1 Bookbinder's Press, 10-in. cylinder, plata. 44x29. 1 Bookbinder's Press, 9-in. cylinder, plata. 40x26. Also, Engines and Boilers from 5 to 100 horse-power, on hand. Also, conical logwood chippers. WILLIAM ARTHUR,
President Atlantic Steam Engine Works, cor. Water and Pearl sts., Brooklyn. 15 2os*eow

STEAM ENGINES

FROM 4 TO 200 HORSE-POWER—Including LOOMIS' PATENT CUT-OFF ENGINES, SLIDE VALVE STATIONARY ENGINES, and PORTABLE ENGINES. Also, IMPROVED CIRCULAR SAW MILLS, GRAIN MILLS, etc.
Send for Descriptive Circular and Price List.
WOOD & MANN STEAM ENGINE CO.,
UTICA, N. Y.
Warerooms, 89 Liberty st., near Broadway, N. Y.
10 ostf and 201 and 203 South Water st., Chicago, Ill.

LIVINGSTON & CO., Iron Founders, Pittsburgh, Pa.
Fine CASTINGS All Kinds.
Light Either Grey or Malleable Iron. 16 2

THE GRAND COMBINATION.—The United States Hay and Cotton Press. Its success fully established and all Presses now before the public pronounced the best in the world. Responsible manufacturing firms and capitalists can now make liberal arrangements with the proprietor for introducing them in all sections of the country. The merits and cheapness of the Press enables them to be sold rapidly and more readily than any others. For circulars and particulars address JAS. H. BIGGS,
Dyer, Lake Co., Ind., or Box 2239, Cincinnati, Ohio.

$10 A Day for all. Stencil tool, samples free. Address A. J. FULLAM, Springfield, Vt.
16 4

Philadelphia Advertisements.

☞ Philadelphia Adver ising Patrons, who prefer it, can have their orders forwarded through T. V. Carpenter resident Agent, 313 North Sixth street.

THE
HARRISON BOILER
HAS ABSOLUTE SAFETY!
HAS GREAT ECONOMY IN FUEL
HAS DURABILITY AND FACILITY OF REPAIR.

Hundreds of these boilers have now been in use for years, giving perfect satisfaction. For descriptive circular and price apply to
JOHN A. COLEMAN, Agent,
53 Kilby street, Boston, Mass.
J. B. HYDE, Agent,
Office No. 9, at 119 Broadway, New York, or to
THE HARRISON BOILER WORKS,
9 13*] Gray's Ferry Road, Philadelphia, Pa.

WOOD-WORKING MACHINES of all kinds on hand. Also, one Gray & Wood planer, one "Wicks" patent resliting mill, one car mortiser, one tenoning machine, and one flouring machine, at a bargain. Address CHAS. H. SMITH, 185 North 3d st., Philadelphia.
15 3os

Soda Fountains

For sale at No. 302 North 13th st., Philadelphia, Pa., by
14 4os J. C. JOHNSON.

Industrial Works.

MACHINISTS' TOOLS AND EQUIPments for Railroad, Iron Ship Building, and Gun Shops.
STEAM HAMMERS,
TURN TABLES, Shafting, Bolt Cutters, Cotter and Key-Seating Machines, Cranes, Cupolas, etc.
9 13os*] BEMENT & DOUGHERTY, Philadelphia, Pa

DRAWING INSTRUMENTS.—A Manual of 112 pages describing all Mathematical Instruments and Drawing Materials, their use, and how to keep in order. Sent free on application by JAS. W. QUEEN & CO., Mathem'l Inst't makers, 924 Chestnut st., Philadelphia.
11 10*os

TODD & RAFFERTY, Manufacturers and DEALERS IN MACHINERY.
Works, Paterson, N. J.; Warerooms, 4 Dey st., N. Y., Boilers, Steam Pumps, Machinists' Tools. Also, Flax, Hemp, Rope & Oakum Machinery; Snow's & Judson's Governors; Wright's Patent Variable Cut-off & other Engines. 9 tf

NICHOLSON FILE COMPANY,
Providence, R. I., Sole Manufacturer of the
Patent Increment File.
Circulars, giving prices and explaining peculiarities of manufacture, sent on application. The best testimonials as to the merits of this File can be furnished. 5 13*

D. BALLAUF, MODEL MAKER, No. 414 Seventh street, Washington, D. C.
Orders for Certified Duplicates of Patent Office Models and Original Models for Inventors. 5 13*

FRENCH BURR MILLSTONES, BOLTING CLOTHS,
Of the very best qualities imported,
Supplied Cheaper than any
other house in the country by
GEO. TALLCOT,
14 13* 96 Liberty street, New York.

FUEL Economized and Power Increased by Carvalho's Pat. Steam Super-Heater, easily attached to boilers, gives perfectly DRY steam, remedies "priming," Address H. W. BULKLEY, Gen'l Ag't, 70 Broadway, N.Y.
9 13*

1868.

Scientific American.

THE
BEST PAPER IN THE WORLD.
Published for Nearly
A QUARTER OF A CENTURY.

This **Splendid Newspaper**, greatly enlarged and improved, is one of the most reliable, useful, and interesting journals ever published. Every number is **beautifully printed and elegantly illustrated** with several **Original Engravings**, representing New Inventions, Novelties in Mechanics, Agriculture, Chemistry, Photography, Manufactures, Engineering, Science and Art.

Farmers, Mechanics, Inventors, Engineers, Chemists, Manufacturers, people in every profession of life, will find the **SCIENTIFIC AMERICAN** to be of great value in their respective callings. Its counsels and suggestions will save them Hundreds of Dollars annually, besides affording them a continual source of knowledge, the value of which is beyond pecuniary estimate. All patents granted, with the claims, published weekly.

Every Public or Private library should have the work bound and preserved for reference.

The yearly numbers of the **SCIENTIFIC AMERICAN** make a splendid volume of nearly one thousand quarto pages, equivalent to nearly **four thousand ordinary book pages.** A New Volume commences January **1, 1868.** Published Weekly. **Terms:** One Year, **$3**; Half-Year, **$1 50**; Clubs of Ten Copies for One Year, **$25**; Specimen Copies sent gratis.

Address
MUNN & CO.,
37 Park Row, New York.

☞ The Publishers of the **Scientific American,** in connection with the publication of the paper, have acted as **Soliciters of Patents** for **twenty-two years. Thirty Thousand** Applications for Patents have been made through their Agency. More than **One Hundred Thousand Inventors** have sought the counsel of the Proprietors of the **SCIENTIFIC AMERICAN** concerning their inventions. Consultations and advice to inventors, by mail, free. Pamphlets concerning Patent Laws of all Countries, free.

☞ **A Handsome Bound Volume,** containing **150** Mechanical Engravings, and the United States Census by Counties, with Hints and Receipts for Mechanics, mailed on receipt of **25c.**

© 1868 SCIENTIFIC AMERICAN, INC.